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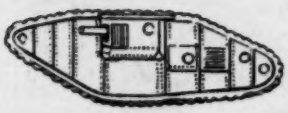

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# 2d Armored Division Combat Loading Morocco

## PART ONE

*by Lieutenant Colonel F. M. Muller**

**Combat loading and unloading of the 2d Armored Division in its three major World War II operations, Morocco, Sicily, and Normandy, is explained in detail beginning with this article on Morocco, which is Part I of a series of three. Colonel Muller, who was a Transport Quartermaster for the 2d Armored Division, is well qualified to write this important series.**

OPERATION TORCH, in brief, was the invasion of Morocco. This operation was executed by Western Task Force under the command of Major General George S. Patton, Jr. The plan called for landings at three different places on the coast of Morocco —Safi, Fedela, and Port Lyautey.

The force landing at Safi consisted primarily of the 47th Infantry Regiment of the 9th Infantry Division, plus a landing team of the 2d Armored Division. This operation was called Blackstone.

The force landing at Fedela consisted primarily of the 3d Infantry Division reinforced by a landing team of the 2d Armored Division. This operation was labeled Yoke (Brushwood).

The force landing at Mehdia-Port Lyautey consisted mainly of one regiment of the 9th Infantry Division and a landing team of the 2d Armored Division.

Although this landing was on a hostile shore it was hoped that the French would not resist and would join the cause of the Allies. This invasion date—D day, was November 8, 1942.

It is not the purpose of this author to write on the economic, political or tactical aspect of the Moroccan invasion, but only that part as affected the combat loading and unloading of the 2d Armored Division.

*Student, The Armored School.

## Loading

All elements of the 2d Armored Division which constituted the three landing teams were to be loaded at the port of Norfolk, Virginia, except that part of the armored landing team to land at Safi, Morocco, consisting mainly of 54 medium tanks of the Third Battalion, 67th Armored Regiment, which was to be loaded at New York, N. Y.

Prior to the actual loading of the designated ships the planning stage was executed by the Staff of the Division at its assembly area at Fort Bragg, N. C. The A. C. of S. G-4, 2d Armored Division, in conjunction with the pertinent General and Special Staff Sections, mainly the A. C. of S. G-3, of the 2d Armored Division, determined the allocation of personnel, vehicles, and supplies for each ship earmarked to transport elements of the Division. These plans incorporated the debarkation phase and included the desired debarkation priority. The landing teams were formed at Fort Bragg and remained separate units for this entire operation. Selected officers were sent to the Transport Quartermaster School at Norfolk, Virginia to learn the fundamentals of ship loading, especially ship combat loading. Ship combat loading is merely the loading of personnel, vehicles and military impedimenta so that, in accordance with a predetermined tactical debarkation priority, the correct type of personnel, vehicles, and impedimenta is unloaded and put ashore in the correct sequence.

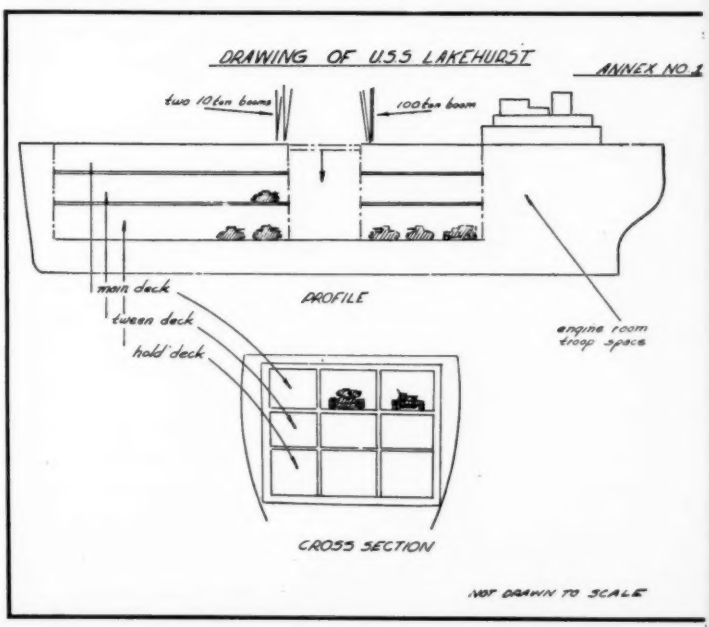
This Transport Quartermaster School was under the Amphibious Force, U. S. Atlantic Fleet, Norfolk, Virginia, and was an excellent school. The greatest detriment was that the prescribed course given the selected TQM's (Transport Quartermasters) of the 2d Armored Division was only about two weeks in duration, and this allotted time was not sufficient to produce trained TQM's. The responsibility of a TQM is quite large, especially considering the basic fact that most of the officers selected were First and Second Lieutenants. A TQM must be a diplomat, improviser, semi-ship's engineer, mess officer, billeting officer, transportation officer, and supply officer, all wrapped in one. Listed below are the major duties of a TQM:

(1) Load the ship.
(2) Act as liaison officer with the Navy.
(3) Arrange for ship billeting of army personnel.
(4) Assign and supervise army ship details—cooks, KP's, police, etc.
(5) Tabulate and maintain records for both the loading and unloading.
(6) Inform higher Headquarters of the progress of loading and unloading.
(7) Insure adequate troop supplies required for voyage—rations, water, medical, etc.
(8) Insure laundry facilities, PX, etc.
(9) Unload the ship.

Upon completion of this course the TQM's were returned to Fort Bragg where they were briefed by the A. C. of S. G-4, 2d Armored Division, assigned to ships, received their allocations as to what was to be loaded on their ship and when, and given the desired debarkation priority. TQM's were then sent to their respective ports to board their assigned ships, secure the necessary nautical data to ascertain their loading plans, compile these plans, and await the arrival of the landing teams.

The landing teams at Fort Bragg were given new or combat serviceable equipment and were engaged in landing exercises on a small lake at Fort Bragg. The movement plan involved a rail movement to the ports of embarkation, and this rolling stock was then in the process of arriving at Fort Bragg.

The author was assigned as TQM of the U.S.S. *Lakehurst* at New York or Sea Train as it was commonly referred to at this time. One major factor which was apparent then was the misconception as to the characteristics and capacities of the designated ships, especially the Sea Train. In the latter case the proposed allocation called for some 300 vehicles, the majority of medium size, the 2½-ton truck type, yet including 54 medium tanks, six Carriage Motor M7's and 12 Engineer Bridge trucks (Brockaways). No information was available on the actual capacity of the Sea Train, and on arrival in New York, where the Sea Train was undergoing repairs and passing from Merchant Marine control to Navy control, it was learned that her maximum capacity was approximately 200 vehicles. This decidedly changed the composition of those elements of the landing team designated to embark on this ship and of course changed the tactical aspect of the landing plans. After the actual compilation of the loading plans it was discovered that the Sea Train could only carry approximately 156 vehicles. This again changed the whole set-up; but the vehicles designated for the Sea



Train were already moving by rail to this port and it was too late to change the train loads or divert their movement. (See Annex No. 1.)

The Sea Train was ready to be loaded on October 15, 1942, and was moored at Brooklyn Port of Embarkation. Naval supplies for the Sea Train were then taken aboard and the author took over the job of loading her. On October 16, 1942, the ship was to be loaded with approximately 60 days "B" rations and five units of fire for each weapon of the landing team. Because of the peculiar design of the Sea Train it was decided to load rations and gasoline forward on the Tank Deck and ammunition aft on this deck shoring off[1] each to allow for the loading of other supplies. Loading went well until about 3:00 P.M. this day when a change directed that because of the number of vehicles designated to be embarked the ration supply would be cut to 45 days. This change involved a balanced ration supply for 45 days, thus necessitating the almost complete unloading of the rations, the determination of a balanced "B" ration for 45 days, and the recommencement of the loading. Changes on the amount and type of ammunition also necessitated unloading certain types of ammunition. This materially slowed the loading.

The vehicles had been loaded at Fort Bragg on rail flat cars in predetermined sequence to facilitate the loading on ship, however, due to the switching of the flat cars in the port area this was of no avail. A string of flats was run along the ship's side and then lifted by the ship's 100-ton boom and loaded aboard. Due to the combat loading this involved considerable switching of the flat cars to get the correct vehicles at the ship's side.

All vehicles were waterproofed by Ordnance specialist teams and this phase was accomplished quite efficiently. Delay was encountered on the loading of ammunition, both on the shipment from Raritan Arsenal and in the civilian labor groups loading the ship. In the latter case it was necessary to augment these dock workers with military details to insure completion of the loading on time.

In addition to rations and ammunition, Ordnance, QM, Medical, Engineer, CWS, and Signal Class II and IV supplies were loaded in amounts as predetermined by higher Headquarters, generally 30 days' supply for the landing team distributed among the ships of the landing team.

All vehicles to be loaded aboard were fully loaded with their organic basic loads of ammunition, rations, signal equipment and ordnance spare parts. Vehicular gasoline tanks were 90 per cent full.

Because of the large number of vehicles of the landing team shipped to New York, the loading of the vehicles was executed to take the maximum advantage of all available space. The Tank Deck or lower deck was loaded mainly with trucks, 2½-ton and Engineer Bridge Trucks (Brockaways). On top of each of these bridge trucks were loaded two trucks, ¼-ton. Trailers were loaded in any available space. Tanks were positioned as close to the vehicle in front as possible taking into consideration the necessary space required to chain vehicles down. The templet-loading of the ship called for the loading of tanks and other heavy vehicles on the superstructure deck—this was done by maneuvering these vehicles on this deck and by using a dock or shore crane. In using this shore crane it was taken into consideration that there would be no such apparatus at the objective and that the ship must be unloaded with its organic booms, one 100-ton boom and two 10-ton booms. The shore crane was used to speed up the loading as the loading of the Sea Train was then one day behind schedule.

In the templet planning and the actual loading the distribution of weight of cargo as affects the ship had to be continually remembered. Since the Sea Train had more cargo space forward than aft the ship resultantly was "down by the head"[2] when the ship was two-thirds loaded. This was remedied by the ship adjusting its water ballast. Difficulty was encountered in loading heavy vehicles on the superstructure deck due to the construction of the deck, objections by the Navy and the lack of chains for securing the vehicles, however, the use of this deck decidedly increased the number of vehicles in the landing force being transported. After the ship had been loaded there were still some 40 vehicles standing on the pier. The adjustment in regard to combat loading priority was computed less these 40 vehicles prior to the loading of the ship. Those vehicles which could not be taken were shipped by rail to Norfolk, Virginia, and lated shipped on the D-20 convoy.

The Moroccan invasion was executed in three main echelons—the D-day on Combat Loaded Convoy; the D-5, and D-20 Convoys, which were convoy loaded.

All loading on the Sea Train was completed by October 18, 1942, and the ship left New York on October 19, 1942, for its shakedown cruise and to rendezvous with the main convoy at Norfolk, Virginia.

The TQM's loading at Norfolk experienced many of the difficulties encountered at New York. In Norfolk, both APA (personnel) and AKA (cargo) ships were loaded by TQM's of the 2d Armored Division and other units of the Task Force. The loading of an AKA ship is considerably different from that of the Sea Train. In the former case the templet system in conjunction with precise measurements was the criterion, while the loading of the Sea Train was similar to LST loading. The 700 APA and AKA ships carried landing barges on davits; these were used to unload personnel and military equipment to the beaches.

Supplies and material were loaded at Newport News, off Norfolk, using gangs of negro stevedores; they received an exorbitant wage (reported $4.00 per hour) and did not earn it; certain of them, experienced

[1]Marine term meaning to bar off, separate, usually by boards.

[2]Nautical term meaning the forward part of the ship, *i.e.*, the bow is deeper in the water than the aft part or stern.

operators of labor-saving equipment, worked rapidly and well; most loafed, asked sailors and soldiers to do their jobs. Actual loading operations consisted of calling on the Port of Embarkation for items, which were stacked on the dock by type and loaded per plan of the ship TQM. The executive officer of the 47th Infantry informed me that supplies were not delivered to the dock sufficiently ahead of time to permit loading prior to embarking the troops; the ships' aide to the executive (aboard *Lyons*) stated supplies arrived in driblets, the stevedores sitting idle and then unable to pick up a fast tempo; changed cargo necessitated shifting items from hold to hold. Ammunition for ballast was made available in New York; ballast promised was late, necessitating a return to port after the shakedown cruise in the Chesapeake. The item of ammunition, which was supposed to be delivered in carload lots *per vessel*, came in carloads *per type*, necessitating sorting, shifting and stacking before it could be loaded. Troop trains schedules were jumbled, and coupled with slowness in loading, arrived in port before supplies were loaded; the presence of troops aboard ship during the loading of supplies was a decided hindrance. Troops first boarded ship per passenger list (alphabetically), then disembarked, formed up in boat teams, and re-embarked. After all ships were loaded a shakedown cruise and landing exercise was held in the Chesapeake Bay. Finally on approximately October 22, 1942, the convoy sailed from Newport News.

## Unloading

The three sub-task forces executed their landings in their respective areas Safi, Fedela, and Port Lyautey on November 8, 1942, with varying degrees of success. Probably the most successful was the landing at Safi.

## Safi

D-day Troops of the assault waves debarked in landing craft; vehicles were unloaded by LCV's between 1100 Z and 1400 Z; at 1400 Z the Sea Train and Titania steamed into the harbor and docked; the remainder of the transports anchored 500 yards offshore, continuing to unload by landing craft. Vehicles, ammunition, gasoline, water and food were unloaded at beaches. (See Annex No. 2.)

D-1 day—All types of supplies were unloaded on the two beaches, although vehicles were routed to one beach only. As the beaches became more and more crowded, landing craft entered the Fisherman's Wharf area tieing to the floating pier. By nightfall unloading on both beaches ceased and only limited unloading continued on all docks.

D-2 day—All unloading on the beaches ceased and unloading was made to the floating pier in the Fisherman's wharf, the south end of the Phosphate Dock and the angle of the Phosphate Dock and Jettee Transversale from landing craft.

D-3 day—No change.

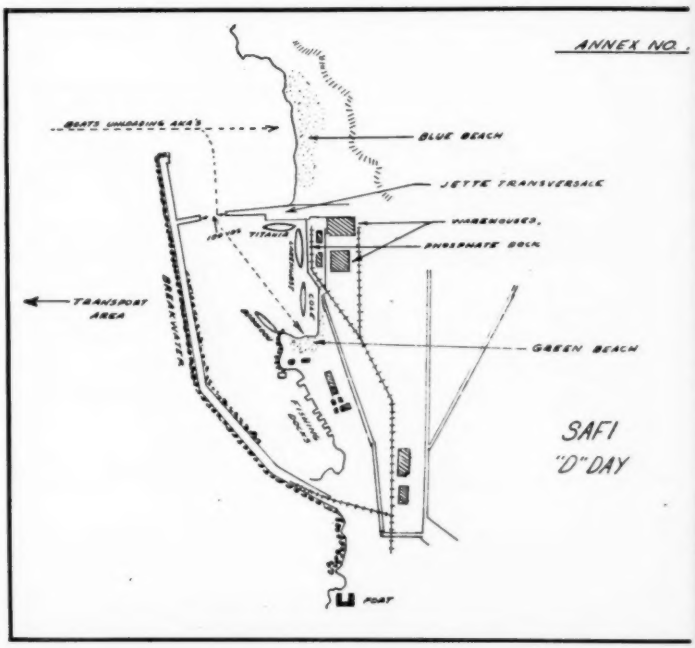
D-4 day—Calvert replaced Titania at the Jettee Transversale.

D-5 day—Lyons replaced Calvert at dock; unloading ceased about 1600 Z and convoy sailed about 2000 Z.

The shore parties consisted of two companies of the 540th Engineer Battalion. These troops were not sufficient to handle the large amount of unloading. Nearly all troops of this unit were absorbed in running the bulldozers and amphibious tractors. The beaches and quays were continually crowded with landing craft awaiting unloading, waits of four hours in daylight and all night long being common.

The unloading of the Sea Train was commenced about 1500 D-day. The unloading went exceptionally well, due mainly to the training of unloading crews during the voyage; these crews were from the Engineer Battalion of the 2d Armored Division. Tanks were unloaded at the rate of one every five minutes until the 100-ton boom broke which delayed unloading about three hours. In spite of this accident, all combat vehicles were unloaded within 24 hours.

The difficulty of unloading began in the unloading of the supplies, mainly gasoline and ammunition. The major difficulty was the piling up of the supplies on Phosphate Dock. No army personnel were available to move these supplies farther inland; Arabs were used but these natives proved quite unsatisfactory—they were slow, indifferent, and unreliable. Stealing by the natives was quite common and it became necessary to post guards and native overseers over every group. Troops of the 47th Infantry Regiment were pulled out of the line and sent back to the port area to aid in the unloading of the ship. This policy proved unsatisfactory: the men were tired, insulted (to do what they considered boring and non-infantry labor) and inexperi-



enced. As a result the unloading of the cargo was materially delayed; it took four days and nights to unload.

By 1800 Z, D-2, all the combat elements of the 2d Armored Division landing team were ashore, and commenced moving north toward Casablanca. It was decided to utilize two destroyers, the *Cole* and the *Bernadou*, loaded with ammunition, fuel and lubricants, and rations as supply carriers. These ships were to proceed to Mazagan, when this port was taken, to resupply the landing team to enable the continuance of its mission to Casablanca. These two destroyers were moored alongside the Sea Train and were loaded with supplies from the Sea Train. The loading of the two destroyers was made at night while the unloading on the pier continued on the opposite side of the ship. The loads for each destroyer involved definite amounts and types of supplies and this requirement proved extremely difficult to execute because of the bulk loading and shoring-off methods by which the ship had been loaded. By unloading channels of supplies, employment of double unloading crews, and vigorous work by all personnel concerned, this loading of the destroyers was accomplished in about six hours. It was necessary then to send experienced unloading crews with these destroyers and these crews came from the Sea Train; this greatly hurt the unloading efficiency of the Sea Train, leaving only a few inexperienced personnel to unload her.

The control on the beaches and the docks was inefficient. Continual minor problems arose by both the Army and Navy and no central control agency was there to solve these problems. The Beachmaster's job was a tremendous one and he had little assistance to enable him to properly execute his responsibilities.

Night unloading was found to be tedious and difficult. It was imperative to have some light in the ship and on the dock in order to expeditiously unload, however, one light led to too many lights and the lights could be seen at far distances. The problem of night unloading at a hostile port was not satisfactorily solved at Safi—lights must be provided that will enable efficient unloading, yet not be visible for great distances. It must be remembered that as late as D-3 the harbor of Safi was under direct sniping fire which harassed and often stopped the unloading. Spasmodic enemy air raids interrupted the loading to a limited degree, however, in most cases the enemy planes were over and gone before the personnel unloading the ship even knew there was an air alert. A good air warning system must be provided.

### Fedela

This landing was made on the face of determined resistance and under a cross fire from the French Coast Defense installations at Point Fedela and Fort Blondin. Unsuspected reefs in front of the beaches wrecked many landing craft. The surf rose and made any landing difficult. Inexperienced coxswains allowed many landing craft to beach and be destroyed. Several landing craft lost their way and discharged their passengers at the wrong places. The landing which was designed to cover a front of four miles, with its bulk on a front of two miles, had its extreme flanks landed 42 miles apart. A large percentage of the landing craft made only one trip to the beach and were wrecked.

In view of failure of the ships to maintain their positions on which the employment of boats had been based, the Commanding General of this force directed all combat troops to go ashore in whatever boats were available on the ship on which they were loaded. As a result, combat teams embarked and went ashore more or less in increments.

In the landing many craft were swamped by the swells while the ramps were lowered. The necessity of power-driven ramp equipment is acknowledged. Some of the boats stuck on the beaches could have been saved had tugboats been available. The magnetic compass proved unsatisfactory and gyroscopic compasses, in spite of their cost, appear to be necessary.

The highest casualties of the campaign were from drownings of men loaded with equipment. The individual load was far too great. Leading waves could not carry the load and move rapidly, nor was there any necessity for such loads. Excess equipment was discarded on the beaches and quays along the streets of town and across the hillsides. Approximate loads for soldiers were as follows:

(1) Full field less roll (includes change of socks and underclothes, toilet articles), (2) 1½ days "K" ration, (3) entrenching tool, (4) individual weapon, (5) trench knife, (6) 2 canteens (full), (7) helmet, (8) ammunition (18 clips M-1, 32 clips 03, 10-20 rd. magagines BAR, 15-30 rds clips T5G), (9) 6 grenades, and (10) gas masks.

### Mehdia-Port Lyautey

The landing forces, consisting primarily of the 9th Infantry Division (minus the 47th Infantry Regiment) and a landing team of the 2d Armored Division met determined opposition and it was only after difficulty that this beachhead was secured. From the unloading aspect many of the difficulties encountered at Safi and Fedela were confronted here.

One major detriment was that on embarking, it was found that attached units had never received amphibious training and that 10 per cent of the men had not fired the rocket launcher or even the Thompson submachine gun. Many landing craft were lost and due to this, only 11 tanks were ashore by D-1.

### Recommendations and Conclusions

Prior to my recommendations and summation of this operation, it must be remembered that this amphibious assault was across the vast distance of the Atlantic Ocean; that inexperienced personnel were being given their baptism of fire, and that it was conducted against

a country felt to be friendly to the Allied cause though appearing hostile as it was under the relentless influence and pressure of Nazi Germany. No such operation, involving an amphibious attack from one continent to another, had ever before been attempted—it was a bold and aggressive step—mistakes were inevitable.

Enumerated below are recommendations for improvement, as pertains to the combat loading and unloading of an armored division, as a result of the valuable lessons learned on this campaign:

(1) Shore and beach party personnel should be highly trained specialists under one commander (Army). This training should be continuous.

(2) Boats should be pooled and under centralized control. Control of these boats, especially at night is essential—all boats should be equipped with TBY radios.

(3) Boat coxswains must be trained personnel—time is paramount in the initial unloading stages, every minute should be utilized to get more equipment ashore.

(4) All transports should be prepared to load boats at the rail.

(5) An adequate lighting system to permit unloading at night which is not visible to the enemy so as to endanger the ship, boats, and unloading personnel should be provided.

(6) A standard rig for boat lines should be used on all transports to facilitate handling boats alongside during darkness.

(7) Loading of all equipment should be in such a manner that a major caliber hit in any part of a ship will not destroy the entire supply of any one item. All stowage should be low and tight, with concentration of weights near the keel, and even distribution of load.

(8) All equipment should be loaded on almost every ship to prevent "putting all the eggs in one basket" and the loss of that item if that ship is sunk.

(9) The installation of a mechanical driven ramp hoist on the LCM(3) is imperative and such a mechanism on the LCV's is highly desirable.

(10) The pneumatic belt type of life jacket should be worn by all troops. The kapok type is unsuitable; it is too bulky.

(11) LCM's, LCP's, and LCV's although generally well designed and capable of giving excellent service, are definitely unsuited for landing through a surf higher than seven feet. In more than one case in this operation when a ramp was lowered the receding seas entered the ramp opening and weighed down the boat, however, expeditious unloading, followed immediately by closing the ramps, would have reduced the number of these casualties.

(12) All troops participating in such an operation must have thorough amphibious training as teams, not individually, prior to such an invasion.

(13) Beaches and docks must be kept clear of supplies in order to unload other supplies. The loss of time by boats standing off awaiting their turn to unload was considerable. All cargo must be moved quickly to less-exposed locations. The huge stocks of supplies on the beaches and docks not only created a bottleneck but a decided hazard in the event of enemy air operations.

(14) Individual equipment of the assault waves should be limited to the bare essentials required for combat. Other equipment can be moved to these troops after the landing has been effected.

(15) Transportation, especially 2½-ton trucks, must be available in sufficient quantities to clear the beachhead of supplies and to supply the advance of the exploiting troops on the beachhead, especially in an armored division. The most vulnerable point of armor is its supply lines—as much consideration must be given to cargo vehicles as combat vehicles.

(16) Transport Quartermasters should be superior officers, thoroughly trained, and preferably either Transportation or Naval personnel, assisted by Transport Quartermasters of the respective units making the landing. The average officer does not know much about the combat loading of ships, nor can he learn this in two weeks. TQM's must be experienced maritime personnel; the responsibility is too great to delegate to officers of combat units, they do not have the necessary qualifications to accept this great responsibility. Such TQM's (Maritime) should remain with that ship and load it, unload it, as long as she remains in amphibious operations. It is much easier to teach Transportation or Naval personnel the essential characteristics and requirements of combat units than it is for an army combat officer to learn the characteristics and requirements of efficient loading and unloading of ships.

(17) It is essential that the loading phase be definite and that loading plans be based on full knowledge of the characteristics of the assigned ships. It is imperative that these plans once formed be adhered to as much as possible; changes result in delay, confusion and inefficient loading. It is also essential that all equipment and supplies be on hand when the actual loading is executed and that all necessary loading preparations have been completed.

In summation, the lessons learned from the Torch operation were not of a novice character, such mistakes were frequent in varying forms before this operation and some are even today prevalent in landing operations. A landing operation, whether over the Atlantic Ocean or a small envelopment along a coast line, presents to a great extent the same problems, and such problems are not unique to amphibious operations. These problems can be overcome by thorough and conscientious planning, and efficient and vigorous execution of these plans. An amphibious operation is difficult, control is the criterion, however, the majority of all problems so encountered can be solved long before the first troops hit the beaches—the answer is training and good sound planning coupled with violent application.

(*To be continued*)

# MOBILE GROUND TROOPS OF THE FUTURE

## by Colonel Hamilton H. Howze

***(Author's Note: It has been difficult to select a title for this article. What constitutes the future for the branch I call "Mobile Ground Groups" is a highly controversial issue, and opinions on the matter are apt to be expressed with some little heat. The whole subject of the future is linked up—though perhaps not vitally—with the name selected for the branch, and that in turn with the old branch allegiances of officers concerned; I have, therefore, agitated this nests of hornets too, to the best of my ability.)***

THESE are the questions to be answered: What are the new problems facing the fighting vehicle? What sort of vehicles should we have? What organization do we want?

Throughout the last war, all of us whose principal business it was to fight tanks kept up an incessant pleading for bigger tanks and faster guns. My own voice was not one of the quietest. Certainly we were out-gunned by the German tanks, and certainly their armor was thicker and stronger than ours. Their motor power appeared to be at least equal to ours, and their flotation was greater. I recall that we were reassured periodically that the greater weight of the German tanks was, all in all, a grave disadvantage to the enemy, what with his difficulties of shipment, crossing bridges, etc. This was all very well; however, if we ran head on into a half a dozen well emplaced Mark Vs or Mark VIs, they had successfully solved their problem, for there they were. The next problem was all ours.

It is difficult, though, not to let our planning for the future become unbalanced by our experience in the last war. I think it is unbalanced: the vehicles and organizations we are now developing seem (with one notable exception) to be designed to continue the last war's fight. I believe that this attitude is wrong, and will lead to trouble.

I contend that the heavy tank, as the basic vehicle of the armored division, has had its day. By "heavy tank," I mean all tanks of weight greater than about 25 tons.

The heavy and medium tanks and self-propelled guns as they are now designed, as well as one or two behemoths that are being produced in experimental form by our Ordnance, are based upon this premise: that a vehicle can carry enough armor to wall itself off from the danger of what goes on outside of it. The very idea of heavy armor is to absorb a hit and deflect it. In the present stage of development of guns and rockets and mines, not to mention what the future may hold for those weapons, the task is unequal. Consider that task: the heavy tank seeks to interpose between its engine and crew, and the enemy weapon, a wide area of metal everywhere so thick and strong that it will deflect, at any point, the projectile which may be thrown at it. The enemy weapon attacks an area perhaps only three inches square.

It is well to recall how our medium tankers managed to stay alive in the last war. Against the German 88 and 75 millimeter tank and antitank rifles, the principal protection to the tank crew was not in the capacity of the tank to absorb a hit, but rather in the ability of the tank to avoid a hit and to destroy the enemy gun. The number of hits which we took without serious damage were a small proportion of the total.

The result of the concept of heavy defensive armor can only result in relative immobility. Even though it may be acknowledged that motor power will be improved alongside of gun power, it will nevertheless remain true that a heavy vehicle must always be more difficult to move than a light vehicle.

American tanks have not, to this moment, been subjected to a number of weapons which presently exist, and some of which we used against the enemy. One of these weapons is the antitank rocket fired by aircraft; another is the variable time fuse fired by artillery (which will serve effectively to drive infantry away from tanks); a third is the antitank rocket, which may be used to saturate an area by the use of multiple barrel projectors massed behind enemy defensive positions; a fourth is the improved bazooka (which in its American 3.5 variety is capable of a long range and an impressive armor penetration); a fifth is the recoilless rifle with a range of upwards of 5,000 yards.

The use of these weapons by the enemy can hardly facilitate the success of our tank onslaught. Taken in addition to the other weapons which were used against us in the recent war, it may appear that the situation is well nigh hopeless.

On the other hand, whatever the arguments which

may be presented against the tank, it is inconceivable that the internal combustion engine will have no function on the battlefield. When we consider that the engine is capable of moving heavy loads and tremendous fire power at speeds far greater than that practicable to the dismounted soldier, it becomes obvious that it will be used by all modern armies on every battlefield of the future. We are left then with the serious task of overcoming the admittedly efficient antitank weapons, many of which are new, so that we may take advantage of the fighting potential of the vehicle.

### "Mobile Ground Troops" Requisites

What are the basic requisites for "mobile ground troops"? It is important that we consider this matter without previous mental commitments.

The precise name for the branch is not of paramount importance. But, although no mere name can forever nullify the effectiveness of a major arm, it is inadvisable that the mission and expansion of the branch should be limited by its name. The name "Armor" was entirely applicable and descriptive in World War II, but it *was* applicable only because the tank of that war was designed and armored to turn an enemy blow. It is impossible for us to prophesy positively, in the light of scientific development, what form of vehicles the mobile branch will utilize in the near or distant future; however, steel armor in its present form is losing its contest with gun power, and until and unless a new type of armor is developed which has perhaps three times the ballistic strength of the present armor, per pound of weight, armor will continue to hold the dirty end of the stick. It follows then that the main characteristic of this force probably cannot, in the future, be defined by the word "Armor," since defensive plate will be a relatively unimportant feature of it. In such a case, new developments which will assist, perhaps, in the accomplishment of the offensive and exploiting role of the arm may be denied it, or only grudgingly permitted, on the basis of the fact that "it is not armor."

It is infinitely preferable that the branch—of whatever name—should have its mission defined to it in the clearest terms, and then be permitted and encouraged to include the weapons, vehicles, and personnel in an organization which will best serve to accomplish that mission.

Certainly the branch should include all of what may be termed the "assault forces" of the branch division—reconnaissance, fighting vehicles, riflemen—and be supported by the branch known as "Artillery." By the same token, whatever mounted fighting elements that are organic to the Infantry Division should be released to the Infantry branch, for their reason of existence is only to assist the Infantry in the accomplishment of the Infantry's mission.

### What To Replace Heavy Tank?

I have previously argued against the "heavy" tank of thick defensive armor; in its stead, what sort of vehicle should we have? Our basic vehicle, and the one around which our organization should develop, should be the light tank, of low silhouette. Its armor should be light, sufficient only to turn small arms and the fragments of grenades and artillery. Its strength should lie in its great offensive fire power. That fire power should take three forms: that delivered by its main armament, which should be capable of destroying at medium ranges enemy tanks of the heavy variety, as well as delivering a good high explosive accurately at long ranges; secondly, that of machine guns; lastly, that which effects blanket destruction close in to the vehicle itself. Attempts are already being made along this line by means of grenades, mines, and white phosphorus which is spewed in all directions alongside the vehicle. These require much more extensive development, but that may be confidently expected if the need is clearly defined. It will be this great offensive power, the ability to kill, and the ability to avoid hits rather than a capacity to absorb hits, which will be the strength of this tank of the future.

Additionally, our tank must be capable of very steep hill climbing; it must have excellent traction, and good flotation; it must carry a crew probably of four men. It will be capable of crossing small bridges, including types of self-propelled light bridging which may be carried organic in the tank battalion; the advantages of this are numerous and important. There must be many of these tanks, so that they will travel in companies of 30 or 40 rather than companies of 17; thus the loss of several tanks of the company will be of lesser moment, and we will pass a burning tank with the same relative disregard that we passed the dead infantrymen in the last war.

It is obvious that the production difficulties in keeping the battle forces supplied with these tanks will be tremendously less than those encountered with the medium and heavy tanks; the same may be said for the difficulties of their transport. By utilizing a light tank, the strategic mobility of our divisions will be made greater, and road and matériel damage and wear, lighter. Air transportability of the standard division will become feasible in the very near future.

Additionally, we shall want personnel carriers for our riflemen. They also must be light, fast, and carry light armor. They must be designed to get riflemen, under reasonable conditions of safety, close up behind the tanks on the objective.

Our reconnaissance elements can readily utilize the above-described light tanks and personnel carriers; these need be supplemented only by improved jeeps (equal peeps) to satisfy the demands of reconnaissance missions.

Finally, of course, we must be supported by self-propelled artillery.

Our organization must be built around the characteristics of mobility, lightness, and shock, and should be

designed to accomplish our mission, totally without bias. The basis of the division should be the tank battalions, and these should number appreciably more than battalions of any other type in the division. It is the present tendency to increase the proportion of infantry in the armored division; this appears to stem from our experience in the last war, without sufficient anticipation of the problems of the next war. To illustrate my point, I present a small (and certainly typical) tactical problem for the consideration of the reader.

Assume that you are in command of an armored task force which is engaged in the pursuit of a withdrawing but nevertheless strong and determined enemy, who is confident that he will eventually win the war. To accomplish your mission, it becomes apparent that you must dislodge the enemy from a position where he has established himself (precise location, as usual, unknown) in strength. The enemy is armed with aforementioned long-range bazookas capable of very deep armor penetration, with recoilless rifles capable of effectively engaging your tanks at 5,000 yards if they can be seen, with several rocket launchers of the Nebelwerfer type which can saturate an area with rockets capable of penetrating the top armor of very heavy tanks; he additionally employs a VT fuse in his artillery, and he is supported by aircraft carrying antitank rockets which will go through the top armor of any tank.

Aside from the other difficulties which face you, the problem is: how shall you employ your infantry in order to assist your tanks in their effort to drive the enemy from his position?

Enemy artillery firing VT fuse will tend to disperse infantry which attempts to travel alongside your tanks, but aside from that, how will your infantrymen assist you against the long-range antitank weapons which are carried by individual enemy infantrymen?

If you put your infantry 500 yards in front of your vehicles, the tanks are relegated at best to a supporting role of doubtful value and certainly are not functioning in the manner of assaulting tanks. If you attempt to form your infantry alongside your tanks, they will have little effect on these weapons. The longer that you take in crossing the terrain intervening between you and the enemy, the longer you will be susceptible to the other antitank weapons, including the aircraft carried rockets, the banks of rockets, and the enemy artillery. The speed of attacking infantry is slow indeed.

It is my opinion that the solution lies in making the vehicle more self-sufficient. To the maximum extent which our inventive capacity will carry us, we must develop vehicles with an ability to close on and overrun an enemy without benefit of infantry except in a mop-up role. To fall back on the concept of large quantities of accompanying infantry is begging the question, and contributes little toward a realistic solution.

It is not meant to indicate that the problem facing the vehicle is not a very serious one. It is serious whether we adopt the concept of light, fast vehicles and many of them, or a lesser number of ponderous vehicles with heavy armor protection. It does appear evident, however, that our attempts to solve the problem should be directed along the lines which follow:

1. Increase vehicular mobility in order to:
   a. Reduce the time of exposure and therefore lessen the chances of being hit.
   b. Make vulnerable to vehicular attack large areas of the enemy position which are not vulnerable to attack by the present cumbersome tank.
   c. Facilitate strategic movements of tanks.
2. Lighten the basic vehicle to:
   a. Increase cross-country mobility.
   b. Relieve difficulties of production.
   c. Reduce shipment difficulties.
   d. Increase air transportability.
   e. Lessen the blow of a tank loss.
   f. Ease bridging difficulties.
   g. Ease difficulties of crossing mine fields.
3. Increase fire power to:
   a. Increase shock action and damage to the enemy.
   b. Provide better protection for the tank.
4. Lower silhouette to:
   a. Reduce target area.
   b. Assist in concealment and deception.
5. Organize the mobile division in such a manner as to require of the fighting vehicle units the development of matériel and tactics which will reduce the reliance on dismounted men.
6. Delineate the mission of the branch so that there are no limitations to its development and adoption of vehicles and organization. The branch should not be tied down permanently to the tank; any combination of vehicles and personnel which will serve to accomplish the mission should be permissible without running the risk of having the resulting organization labeled "infantry" and therefore taken away from the branch and placed in another. An officer assigned to the branch should serve in all type units which compose it.

Above all, let us remember the function of the mobile division. It should be capable of attack of a strong (and partially fortified) enemy position, of deep punishing exploitation, of relentless pursuit, of acting as a mobile reserve as part of a larger force, and of a measure of defense. It must be capable of losing a large number of vehicles, yet retaining operative a considerable battle strength. The wherewithal of the division to accomplish its mission should not be limited by preconceived ideas of branch, nor should the composition of the branch be limited to those vehicles and that personnel which now come under the definition of the word "armor."

# Technique Of The Tank Platoon As The Point In An Exploitation

*by 1st Lieutenant Thomas W. Burke**

RIDING in the leading vehicle in an armored exploitation can, and often has proved to be, rather deleterious to one's health. At the very best, it is something of a strain to the nervous system. Of course, there is no way to make this task just wholesome, clean fun such as would appeal to any red-blooded American boy. However, certain techniques learned over a long period of time, by trial and error, and from watching and noting the trials and errors of others, have worked well for the writer.

As a tank platoon leader in an Armored Division, the writer was often called upon to be the point commander in exploitation missions.

The division used a "married" formation throughout. Consequently, when a tank platoon was assigned to the point, the armored infantry counterpart also became part of that point.

Ordinarily it was left to the tank platoon leader to command this group and to decide on the formation to be used. Many, many variations were tried out by platoon officers. Several factors had to be considered. Flexibility was an important item. Terrain, weather, expected enemy resistance, and speed of the advance all entered into the picture.

One troublesome factor was the lack of communication between the half-tracks of the infantry platoon. If a fight developed and these half-tracks were scattered, the problem of control was acute (particularly after replacements had been made).

As has been previously stated, several variations became somewhat standard. One of these was tank and half-track alternately. This formation has several disadvantages. For example, it spreads the tank fire power out too far and makes the tank platoon leader's control problem more difficult. Then, too, the infantry control problem is extremely arduous. An outstanding tank platoon leader used this formation, however, and it worked pretty well while he lasted. His chief argument for it was the fact that each infantry squad could protect the tank ahead of it from close-in antitank measures.

However, the writer believes the disadvantages outweigh the advantages in this case.

Another formation used by many platoon leaders, was three tanks, the infantry platoon leader's half-track, the other two tanks, then the four other half-tracks of the infantry platoon. This system enabled the infantry platoon leader to be far enough forward to see and size up the situation or to confer with the tank platoon leader when necessary. In addition, his platoon was all together and far enough back so that it wasn't necessarily under fire and could form and attack as a unit.

The formation worked out quite successfully but it left a thin-skinned vehicle rather far forward and the infantry platoon leader was still too far from his platoon. Then, too, the half-track hampered, to a degree, the firing of the two tanks behind it. The writer used this formation for several months but finally lined up with the tanks in front and the infantry behind in column and all together.

This formation put all the tanks up where they could be fired and maneuvered at will. Each tank supported the one in front, each had its sector to cover and opposition quickly felt the weight of the combined fire. Several instances occurred when a tank was hit but seldom did the antitank weapons get more than one.

The infantry riding as a group were in good order and could, and did, dismount and get into action quickly on several occasions. A feat seldom, if ever, achieved by the other formations which have come to the writer's attention.

A great deal of eyewash has been written and spoken

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about the subject of riding infantry on the tanks. This was the rule in certain outfits. It was not uncommon to see a half dozen thoroughly uncomfortable doughboys, often wet, often cold, and always unhappy, clinging precariously to the deck and sponsons of the leading tanks.

They were there as close-in antitank protection. Peculiarly, many died when the bazooka hit. Others were killed by antitank gunfire, machine gunfire, et cetera. If they hadn't been there the tanks by using wing man tactics and reconnaissance by fire had little or nothing to fear from bazooka men. If you were bazook-ed in an exploitation, you were sleeping!

Of course, in a night movement, two or three doughboys on every tank is a good idea and will offer some protection to the tank when it is standing still. Even then they should be relieved often so that they will be alert and energetic in playing this role.

In this advance party, where should the platoon leader ride? In our division and others, he rode the lead tank. As the late General Patton said, "You can't push a piece of spaghetti, you've got to pull it." Actually, of course, there were several advantages, chiefly the ones of officer prestige and platoon morale. However, it was not good for the morale of the platoon leader's crew necessarily, although the writer detected a bit of quiet swagger cropping out in his own.

Also, a trained officer should have been able to follow a prescribed route more easily. Unfortunately, this wasn't always the case. In fact, it is the writer's firm conviction that had the Germans torn down the signposts, half the American armor would have been lost, or at least, noticeably slowed down.

The "book" says the point should be a tank section, then the platoon leader, then the other tank section. This is a good idea. It is sound and workable. Too often when the platoon officer was in the leading vehicle, he became embroiled in a fire fight and was too busy properly to employ his platoon. Too busy, in fact, to report the situation to his company commander. This was confusing, ineffectual, and time wasting all around.

If the platoon leader was riding third he might have that moment or two in which to make his dispositions and to report, before becoming locked in the old "do or die" business.

Another advantage is the one of rotating the point job among all the tanks, keeping a fresh, alert man in front. Then there is the obvious saving in platoon officers, on whom the government spends certain sizable sums to train.

Once the formation or order of march is decided upon the question arises: how should this advance party move? In the exploitation phase speed is of paramount importance. Speed makes for surprise and saves lives and cannot be underestimated. The fact that a swift, aggressive advance actually saves lives in the long run is undisputable. Nevertheless, there are certain methods of movement the advance party can use which will offer a better chance for survival, while accomplishing the mission, than others.

In short, there are certain small techniques which, if employed meticulously, contribute to a fast, uninterrupted advance and minimum losses. The most commonly overlooked of these techniques, apparent in many of our Armored Divisions, was caused by self-styled "aggressive" commanders, who in a mistaken lust for speed "threw the book away." This error which caused needless confusion and actual loss of time was the one of allowing no distance between elements of the advance guard.

What occurred was this. When the leading element ran into fairly stiff resistance it was committed piecemeal, chopped up, and a delay was occasioned by the resultant confusion. If there had been an interval, that is to say, a distance between the point, the advance party and the rest of the advance guard, the situation would have developed more slowly and clearly, and the commander of each element would have had time and space to exercise his command function and use his troops in a deliberate, sound, tactical manner. Thus he could have brought to bear the necessary force quickly to overcome the resistance.

Of course, the distance between elements should not be great, as one of the precepts of exploitation is to hit 'em hard and quick. However, a blind hammering, taking unnecessary losses, is not a part of the art of war, dependent, as it is, on the tank production capacity of the home front.

How should the point platoon move? Should it move in column down the road at an uniform pace? This was the usual manner in most divisions in exploitation phases. However, it is not the most intelligent and it is not the fastest. Furthermore, it is not the steadiest.

The best method in every sense is a movement by bounds; that is, within the advance party. The way it has worked superbly is this: the Advance Guard commander (leading tank company commander) rides behind the point platoon at some distance. This distance, of course, varies with the terrain, but usually should be sight or not more than 500 yards. This Advance Guard commander rides at an even pace (often set by the combat commander). He is accompanied by an artillery forward observer, and possibly, by a forward air controller.

In front of him the point platoon works. The leading three tanks moving rapidly from cover to cover under protection of the second section. Great speed can be obtained by making these bounds in an alternate manner. When resistance is met the Advance Guard commander stops, sizes up the situation and takes action immediately. There is a distance between him and the point and he is free to employ his support intelligently or to by-pass obstacles or strong points without the necessity of back-tracking and reversing the column.

This system was employed by the writer in the latter

stages of the war during the advance to the Elbe River. It was discovered that by moving this way the Advance Guard actually had to be requested to slow down by an exceptionally fast moving Combat Commander.

While on the subject of movement let us consider the method of advance employed by this lead platoon. As has been stated, the lead three tanks move quickly from cover to cover under the support of the other section. By quickly is meant *top speed*. In addition these moving tanks should take what might be called evasive action (only, of course, if contact is believed imminent). If possible, terrain and weather permitting, these tanks should move abreast or in a modified wedge formation. Usually one on either side of the road and one continually crisscrossing the road. The writer has said they move from cover to cover. Naturally the distance from one covered position to another may be great, in which case the length of the bound is limited to good fire support from the stationary section. Better not make it more than 600 yards. These tanks now halt suddenly and the other section moves up fast.

The fastest method is for the platoon leader to pull out in front of this second section and lead it in a fast alternate bound. The safest way is to displace forward successively because the forward section, while halted, has had a chance to size up the route ahead, pick the next stopping place and perhaps reconnoiter by fire. This seems a good place to take up the small matter of the use of binoculars.

The writer feels he can state without fear of contradiction that binoculars intelligently, quickly and ceaselessly used by tank commanders saved many and many a tank. As is readily apparent to anyone who has tried they cannot be employed in a moving tank, even on the smoothest of roads. All of which is one of the greatest of arguments for movement by bounds. A hasty reconnaissance through the glasses saves many a round of ammunition as the alternative is reconnaissance by fire. This, too, is the reason the writer stresses the fast move and the sudden stop.

Early in the writer's experience, in fact, during his first hour or two of combat, he made the discovery that his driver was too well trained in the smooth stop. When ordered to halt, he coasted to a nice, easy stop. The writer put his binoculars to his eyes as the tank slowed and tried to observe ahead. The vibration made this absolutely impossible until the vehicle actually came to rest. During this 15 or 20 yards of coasting, the writer was virtually blind and the tank was an easy target, not having even the small advantage of relative speed, Needless to say, it became a part of the driver's technique to halt as abruptly as possible when commanded.

This mention of binoculars leads naturally to a discussion of reconnaissance in general. In the exploitation phase of an armored advance, speed and surprise are essential ingredients. There will be no covering force, no reconnaissance ahead of this leading tank platoon. However, if this platoon leader wants to give himself a chance for survival, he resorts to three types of reconnaissance (always remembering, though, that speed and surprise are potent advantages for him and must not be marred by wishy-washy, overcautious progress). These forms of reconnaissance are: use of binoculars, reconnaissance by fire, and personal dismounted reconnaissance. Added to these might be a fourth. This fourth one is beyond words to describe. It is incredible to many people. This is the much sneered at "Nose for Krauts," which many of us believed, and still believe, we had.

Be that as it may, we can discuss the more orthodox methods. The use of binoculars has already been discussed to some extent. It is nearly superfluous to say that scrupulous care must be taken of them. Cleaning material must be handy to wipe away dust and rain. There is a nice, very precise length of the neck strap. Naturally the focus settings must be known, in fact, they must be instinctive. It might be mentioned here that, as he moves, the tank commander picks his danger spots and as soon as he stops, quickly scans each one, then goes back over them again more slowly.

We come now to that highly controversial subject: reconnaissance by fire. On this subject the writer had two complete changes of opinion. During his first days in combat, he employed it extensively. Later it seemed to be distracting, to destroy the element of surprise. The writer began to depend on observation. Then he gaily rode into a neat ambush just across the Rhine. From there on in he fired on everything remotely suspicious on the ground that it was German in any case. Of course, the life span of tractors and other farm vehicles of suspicious silhouette was short indeed.

More seriously it should be said that reconnaissance by fire is almost a necessity if moving steadily. It is sometimes a waste of ammunition but it has a decided morale factor. It is good for your morale and decidedly disturbing to the other fellow's. However, it should be carefully controlled and done intelligently. A movement by bounds, permitting a good look through the glasses eliminates much firing. It is good also to have some sort of signal to notify those behind that you are merely reconnoitering by fire. Say two short bursts from the co-ax. If this isn't done some of the infantry behind in the half-tracks will start shooting 30s, 50s, and rifles at everything in sight, thereby thoroughly confusing the issue. Certain conditions call for fire reconnaissance such as heavy woods, hedge lined roads, isolated buildings on the flanks and others. The ammunition supply, particularly that readily available in the turret, must not be depleted and in some cases may be an important factor restricting this probing fire.

The third type of reconnaissance is the one most often overlooked by tank officers. That is the dismounted personal reconnaissance. Often there wasn't time. More often the writer is inclined to believe it was merely an unwillingness to leave that steel shell and

expose one's person in that lonely, lonely and so very quiet no-man's land. Drawing again from his own experience, the writer became a believer on the third of August, 1944 when in Yvre, France, he turned a right-angle corner in a narrow street and came face to face with a MK IV tank at the ridiculous range of 30 yards. The tank was manned and obviously waiting. Thanks to a gunner who needed no urging nor even a command, the writer is presently able to pen this article.

Thereafter, the writer dismounted and took a peek whenever it seemed indicated. It is better to sneak a peek over the crest of a hill and around the corner than to barge over or around with a tank. You can stretch your luck just so far!

Much has been said about control. Control of the individual tank, the platoon and the company. First things must come first. Until one is able to control a tank almost as readily as a good rider controls a horse, he is not ready for the designation, Tanker. This control is by interphone but that doesn't tell the whole story. First there must be a system, a code, a standard procedure. Incidentally this should be standard in the platoon and the company at least. Actually it should be standard throughout the Armored Cavalry. Coupled with this procedure are certain other factors less tangible but mainly based on a close understanding of each other by the commander and driver. This obviously can only be achieved through long practice and, while highly desirable, is not necessary as long as there is a standard procedure. That this procedure pays off was evidenced to the writer during the recent misunderstanding in Europe when, because of breakdowns and losses, it was necessary for him to fight with seven entirely different crews for varying short periods.

Once this control of the individual tank is achieved, incidentally it involves set procedures between the turret crew members as well (a gesture or a poke or a slap is quicker than the interphone), we move into control of the section and platoon. For speed and ease hand and arm signals are a must and are only limited by the intelligence, state of training and ingenuity of the people involved. Another factor which makes these signals a necessity is the constant radio failure. This ever present failure was due not to design but to the tremendous abuse it was necessary to give the tank radios in pursuit operations. They were turned on constantly and no time was available for maintenance.

Closely coupled with hand and arm signals was the setting up of simple but rigid standard operating procedures. Some of these were simple plays something like the plays used in football. Others were the sectors of responsibility. Each tank commander had his own and stuck to it. A system the writer employed involved his tank and the first section. When he halted or signalled a halt, the No. 2 tank habitually pulled up abreast, if possible, and on the right and immediately scanned in that direction. The No. 3 tank performed in like fashion on the left. The following section took the responsibility for the extreme right and left flanks and prepared to move in either direction upon receiving a signal.

Connected with this is a lesson we learned through bitter experience. The German antitank guns, whenever possible, were sited to be mutually supporting and designed to suck one in, that is to say, to mousetrap the unwary. At first while using the system outlined above the No. 2 and No. 3 tanks would pull into their positions in good style. However, if the platoon leader was firing to his front their attention naturally was attracted and without order they began to fire at targets to the front. Some of our people then got knocked out by fire from the flanks—the worst part of which was the fact that no one saw where the shot came from. This experience made it necessary for the No. 2 and No. 3 tank commanders to ignore the front and to cover their own areas. Naturally they glanced quickly every moment or two toward the platoon leader for orders but rigidly covered the sector for which they were responsible.

It can be said that control within the platoon depends on many things. Experience and practice, of course, are the best ways of developing this control. Then there is the method of control often listed as the final resort in the texts. This is usually referred to as "example of the commander." Nothing can take the place of this method. However, it will have no effect unless the commander has achieved a reputation for intelligence, for skill and has been able to inculcate in his people an unswerving all for one, one for all spirit. While the writer doesn't necessarily advocate this policy for units larger than a platoon, he is convinced that nothing short of unqualified respect will do. If coupled with this respect, he can generate a spirit of absolute, utter comradeship his path will be easier; his chances for success then will be most likely.

The tank platoon leader is faced with a situation unique among officers. Each crew has five men. He is part of the crew of his tank. Obviously as a tank commander he has many menial, purely physical duties to perform. He must help with the refueling. He must clean guns. He must help change tracks. He stands guard duty in combat. It is necessary for him not only to perform these duties but he must do them expertly. He cannot ever exhibit fear for he must zealously guard the morale of his men. During an exploitation when men and machines are pushed to the limit, his job is multiplied many times. These are the times when his good nature cannot, even momentarily, fail. All this can be accomplished easily if the leader has a genuine affection for his men and thoroughly understands their weakness and their strength and respects their inherent nobility.

This article has no footnotes, no references but it is the result of one man's research, his trials and errors and the trials and errors of many others who are now represented by a white cross somewhere in Europe.

# 26TH CAVALRY (PS) BATTLES TO GLORY

*by Lieutenant Colonel William E. Chandler*

***(Editor's Note: Here is the concluding part of this first complete and authentic history of the 26th Cavalry (PS), written by Colonel Chandler, former S-2 and S-3 of the regiment during the days following the Jap attack on the Philippines and until the Islands fell in April, 1942. Part II ended with the regiment bivouacked north of Bagac. Captain Wheeler, commander of Troop E-F attacked the Japs at Moron on January 16, 1942. He then withdrew his troops, but was unable to pull out about 25 of his horses. The history continues.)***

## CONCLUSION

A DETAIL under First Lieutenant Hardewicke was sent at daylight to Moron by motor to regain the horses. He found that the enemy had again wrested most of the town from the 1st Division, but he believed he could get to our horses by stealth and a little fighting. He was joined by Major C. A. Thorpe, 26th Cavalry, who was on detached service as Provost Marshal I Corps. After a short discussion, it was decided to make the attempt and Major Thorpe went along for the fun.

Hardewicke's detachment was lured into an ambush by a Japanese in Philippine Army uniform and Hardewicke was killed and Thorpe wounded at the first volley. Major Thorpe managed to extricate the detachment from the ambush and with the aid of First Sergeant Belhara, Troop F, who had protected the horses throughout the night with one light machine gun and two soldiers, brought most of the horses back to our lines. Belhara arrived at Bagac late in the afternoon, very apologetic because he had lost two or three animals in the action. That was the type of noncommissioned officers with which we were blessed.

January 18 and 19 were quiet, but on the 20 the regiment was alerted for action. Japanese were reported near Bani and Guitol north of the Pilar-Bagac road between the I and II Corps and well behind the front-line positions. Captain Barker's motorized unit was sent to the threatened area prepared to counterattack on orders from the Commanding General of the 31st Division (PA). Meanwhile, it had been decided by General Wainwright and Colonel Pierce, both old horse-cavalrymen, that the jungle terrain of Bataan in a de-

fensive situation was no place for horse cavalry. It was reluctantly decided to send all our animals to a pasture area near Agloloma Point and there turn them over to the Quartermaster. Plans were made to make this move on the night of January 22, employing practically all men not in Barker's unit or otherwise engaged.

The Bagac-Moron road was cut on January 21, at Kilometer Post 164 by bands of Japanese infiltrating over the western slopes of Mt. Silanganan. At first it was believed that the enemy force was small in numbers, and reserve units of the 1st Division attempted to reopen the road, but met with little success due to the towering trees and deep gorges of the area where Japanese snipers lurked unseen until practically stepped upon. General Wainwright sent in a composite force of Philippine Scouts made up from gun crews of the 155mm Coast Artillery guns in the sector, but they had no success either. It was now evident that the hostile force was considerably larger than at first supposed and that more force would be needed to subdue it, and quickly too, as the 1st Division was receiving heavy attacks on its front and was completely cut off from support by this obstinate group of Japs astride the sole route of communication to the rear.

General Wainwright ordered Colonel Pierce to send Captain Barker's motorized unit to the threatened area and accordingly it was withdrawn from the Guitol-Bani area and sent to Kilometer 164. The remainder of the regiment was by now engaged in moving the horses to Agloloma Bay. Captain Barker attacked late in the afternoon of January 22, driving the enemy northward along the road four and one-half kilometers, but was there stopped by a deep ravine and almost impenetrable jungle. On January 23, the Second Battalion Philippine Constabulary and Company K and a Mortar Platoon of the First Battalion, 1st Consabulary were added to Barker's force, but further attacks were stopped in their tracks by terrain and enemy fire.

Meanwhile the 1st Division had begun to break up under repeated enemy attacks from the north and began to stream back by the beach trails west of Barker's position. By January 24, it was evident that even if Barker did succeed in opening a way through the Japanese position they would find no organized line on the 1st Division's position. On the contrary, enemy units pouring through the gaps in that line were constantly reinforcing the forces opposing Barker.

In the meantime, General Parker's II Corps on the Abucay line was having its own troubles. Repeated heavy attacks had been thrown back and one major penetration of the line rectified by counterattacks. Now, however, Japanese units, by just such infiltration tactics as had been used on the west, had moved around General Parker's left flank over the eastern shoulder of Mt. Natib and were now threatening his flank and rear. It is obvious that the Moron-Abucay line was no longer tenable and plans were made to fall back on the Reserve Battle Positions running from Bagac to Orion.

Orders were received January 24, from General MacArthur's Advance Command Post to occupy the Reserve Battle Position on the night of January 24 and 25. Orders from General Wainwright directed that the I Corps' withdrawal would be covered by the 26th Cavalry with the Second Battalion, 2d Philippine Constabulary, and Company K, 1st Constabulary attached. Before more than preliminary plans could be made, the time of withdrawal was changed to the night of January 25 and 26, and Captain Barker was ordered to hold on for one more day.

To make things more difficult, while our front was giving way, the Japanese had made several landings on the west coast of Bataan well behind our lines and were threatening to cut the West Road, only communication route to the Army supply dumps near Mariveles. Should this line be cut, our situation would indeed be precarious and the number of our days short. General MacArthur was throwing everything he had into the balance, one battalion of the 45th Infantry, some planeless air crewmen, Philippine Army Air Corps men, shipless sailors under Lieutenant Commander Bridget, who later lost his life under heroic circumstances on a Japanese prison ship, and portions of the 71st Division which had suffered so severely at Sison.

### Pierce Made Brigadier General

The task of welding these diverse units into an efficient fighting force capable of repelling the repeated attacks of Japanese landing forces was a formidable one. General MacArthur added the sector to General Wainwright's zone and promoted Colonel Clinton A. Pierce to Brigadier General at General Wainwright's request. General Wainwright entrusted this new task to his old friend who had already proven his mettle in Northern Luzon. Accordingly, General Pierce left his old regiment at this rather critical time, leaving the situation in the capable hands of his executive officer, Lieutenant Colonel Lee C. Vance.

Upon the departure of General Pierce, Colonel Vance immediately called a staff conference and after appointing Major T. J. H. Trapnell to be executive officer, he set forth his plan for the forthcoming operation. Captain Barker's force would hold its present position just north of Kilometer 168 as long as possible. When forced to retire, he would do so by bounds securing the maximum of delay. Troop A would take a position on the high ground north of Bagac prepared to take over the action as Barker's force passed through its lines. Troops E-F and G were held in the bivouac area for use as the situation dictated. Other delaying positions were selected and reconnoitered and the regiment waited for the kick-off.

Late in the afternoon of January 25, Captain Barker's force, having executed repeated brilliant delaying actions along the heavily wooded and winding Moron Road, passed through Troop A and with its cohort the

Second Battalion, 2d Constabulary, marched past Bagac to an assigned bivouac area on Saysayin Ridge about two kilometers east of the West Road on Trail 9. Troop A took over the action and Troop E-F moved up behind in readiness to take over in turn. Troop G prepared to take over from Troop E-F on a position just north of the regimental bivouac area.

The plan clicked like clockwork. Each unit, as it was outflanked by Japanese units toiling through the jungles on each side of the Moron road, moved through the already prepared line of the troop to the rear and moved southward to the assembly and bivouac area. The delay provided was sufficient to enable the other units of the I Corps to occupy their assigned positions on the Reserve Battle Line without enemy interference. The regiment reassembled after dark at its new bivouac area on Trail 9, once more behind the lines of the I Corps.

The regiment settled down in I Corps reserve on January 26, and continued refitting and reorganization. One troop was sent to I Corps headquarters to act as a guard troop as small groups of Japs were loose in the mountains behind our lines. For the next five days patrols of officers and key noncommissioned officers made planned reconnaissances covering the entire I Corps front and approaches thereto, familiarizing all concerned with the terrain where the regiment might be called upon to counterattack. It was during this period that the regiment learned with pride of Troop C's successful raid on the enemy airfield at Tugugerao. Though completely cut off from support, Captain Praeger and his men were carrying on their own war in fine style.

A call from headquarters I Corps on January 28, sent Captain Barker's unit to Kilometer 200 on the West Road where Japanese snipers had been reported firing on traffic on that vital supply route. The jungle was scoured on both sides of the road without success. These alerts continued at odd intervals all during and after the fighting on the west coast. Individual Japs were evidently slipping through General Pierce's lines at night and then interfering with traffic on the West Road. None were ever caught in the act, however.

A program of training in jungle warfare started on January 30, and continued whenever possible throughout the ensuing two months.

On the night of February 1, the regiment was alerted by I Corps and ordered to move at once to a point on the coast just north of Bobo Point. A hostile landing was reported there and all other troops were engaged with the landings farther south. The regiment moved at once, preceded by Scout Cars, but when the advance guard arrived at the designated spot all was quiet. It afterwards developed that a landing had been attempted about 1,000 yards to the south, but had been stopped cold by General Pierce's artillery and our remaining P-40s which had strafed and bombed the landing barges from improvised bomb racks. So far as is known, not a single craft reached the shore.

The regiment was ordered on February 2, to be prepared to assist General Pierce's forces if required, but were not to get into action under any circumstances except by express authority of the Commandng General of I Corps. The 26th Cavalry was now the only reserve on the west coast not committed to action. We remained in bivouac north of Bobo Point and the S-3 contacted General Pierce and the S-3 of the 57th Infantry, and brought their situation maps up to date for this new area. This day also marked the return of Major J. C. Blanning from Headquarters I Corps, where he had been Headquarters Commandant since passing through Bambam en route to the action in north Luzon. Captain Houston Farris was sent to Headquarters I Corps to take over from Blanning who was given command of the Second Squadron.

Word came on February 3, of a penetration of the 11th Division's line west of the Pantigan River and the regiment was ordered to move to the junction of Trails 8 and 9 and stand by to counterattack if needed. The 11th evidently managed to scrape up a reserve somewhere, because our orders were cancelled before we got under way. More serious trouble seemed to be brewing in the Agloloma Point area where fanatical Japs were making repeated attempts to break through the line of General Pierce's conglomerate forces. A section of scout cars, previously patrolling the West Road for snipers, was ordered by I Corps to patrol the Agloloma Road in search of a group of Japanese said to have broken through the Philippine Constabulary lines. This, of course, was impractical at night for scout cars and nothing, unfortunately, was found.

If we could have disposed of this group of Japs here we would probably have been spared a severe shock some weeks later. At daybreak a platoon of Troop A, under Lieutenant William Leisenring moved into the area and found no trace of the Japs, but they did find a 300-yard gap between a battalion of the 45th Infantry and a unit of Philippine Constabulary. Leisenring closed the gap and notified Regimental Headquarters where the information was passed on to the units concerned and hole was plugged, relieving Leisenring. The fact that the regiment received a reprimand for allowing even this one platoon to become involved in action for a few hours is a good indication of how desperate General Wainwright was for reserves at this point. The 26th Cavalry was his only means of influencing an action and he was determined to keep it in hand until the proper moment. This situation doubtless saved our depleted ranks from many small actions in the following weeks. In consequence, when we next went into action we had recovered much of our strength.

### I Corps Situation Serious

Meanwhile the situation on the front of I Corps was becoming serious. It now appeared that considerable

Jap forces had managed to get behind the Reserve Battle Position on the night of January 25 and 26, during the confusion of our occupation of that position, and were well dug in in the thick jungle in rear of the 11th Division's left flank in the Tuol River Valley. A penetration by the enemy between the left flank of General Brougher's 11th Division and Brigadier General Jones' troops of the West Subsector, I Corps, had permitted reinforcement of this hostile pocket with both men and arms and what came to be known as the Tuol Pocket had become a formidable threat to our front lines. The fortress of Bataan had suffered another serious breach that must promptly be walled off as those on the west coast had been. Generals Brougher and Jones had seriously weakened other positions of their lines to send troops to the danger spot and General Wainwright had obtained a battalion of the 45th Infantry (PS) from General MacArthur which had been sent there also.

The situation by February 6, in the Agloloma area was sufficiently under control to permit alerting the 26th Cavalry for a possible move to the Tuol Pocket where the situation was becoming serious. Orders were not received, however, until about 10:30 A.M., February 7, and the regiment moved out at 11:00 A.M. for the junction of Trails 8 and 9. The nearest practicable bivouac area to this point, however, was on Trail 17 just west of its junction with Trail 19 and this spot became the regiment's home for the next five weeks.

Lieutenant Colonel Lathrop, commanding the 45th Infantry Battalion at the Tuol Pocket, was given complete command of the operation by Generals Brougher and Jones, together with all troops assembled by both generals for the operation. This unified command, under a capable officer, soon began to show results although the gain was pitifully slow, sometimes only a yard or two a day against a well dug in and fanatical enemy. In any event, while prepared to go to Colonel Lathrop's assistance at any moment, and kept familiar with the situation by daily contacts of the two S-3s, the 26th Cavalry was never called upon to do so.

The regiment slowly and rather unbelievably settled down to what was to be our longest period of quiet in our short war. This does not mean that we were inactive. On the contrary, Colonel Vance initiated as intensive a period of training and preparation for the final battle as the condition of the men would permit. Rations had been cut to a substandard of seven ounces of rice per man per day and all were feeling that lack of sustenance. Malaria and dysentery were prevalent throughout the command and the short rations provided small resistance to these plagues. Men and officers responded nobly to the demands of their commander, however, and new techniques of jungle warfare were evolved and practiced until they became second nature. New formations and stratagems were invented, discussed and tried out. Those approved were adopted and practiced for use in the inevitably forthcoming struggle.

Systematic reconnaissances of the I Corps front from the Pantingan River to Pucot Hill were carried out under the supervision of the Regimental S-3 and maps were made of new trails and of the positions of all front-line troops. Preliminary plans were prepared for movements to and action at all likely points of attack. These plans were tested and squadron and troop commanders thoroughly familiarized with them. Daily contact was maintained with front-line troops and the situation map kept up to date so that the regiment would be completely familiar with the situation and terrain in any area in which it might be called upon to function.

Only one action interrupted this long period of training and preparation. On February 15, Troop A, en route to I Corps Command Post to relieve Troop G as Corps Headquarters Guard, encountered three Japs. One was killed and one captured and turned over to G-2, I Corps. One escaped. At dawn February 16, the regiment was awakened by heavy small-arms fire from the near-by motor pool of the 1st Division. Investigation disclosed that a large party of well armed Japs had stumbled upon the motor pool in the dim morning light. The regiment turned out in a hurry and went to the assistance of the Philippine Army troops. Several Japs were killed and two wounded prisoners taken. The balance of the enemy disappeared into the thick jungle to the north and, although our combat patrols searched for several hours, no further sign of them was found.

Questioning of the prisoners disclosed that they were a part of a group of about 80, commanded by a lieutenant, which had slipped through General Pierce's lines on the west coast about three weeks previously, possibly through the gap Lieutenant Leisenring had found on February 3. The prisoners said that their officer intended to break through our front lines and rejoin the Jap forces on our north front. These men were in good shape physically and had evidently been raiding Philippine Army supply dumps in the rear. The last of our patrols came in late in the morning with negative reports. I Corps was notified and we settled down to wait for the next outbreak of this band of Japs. It was obvious that they would be heard from soon somewhere near the front.

Word was received from I Corps at 4:00 P.M. that a large group of Japanese had been located in the rear of the 91st Division which was the left flank unit of General Jones' West Subsector near Bagac. The Japs were in the Tiis River Valley behind the 91st Infantry's right flank and General Stevens, 91st Division Commander, had no reserves to clean them out. Consequently it was up to the 26th Cavalry.

It was assumed that this was the group which had come so near us that morning and Major J. C. Blan-

ning, who had been bemoaning the fact that the regiment had seen no action since he rejoined from I Corps Headquarters on February 1, was given the welcome task of eliminating them. He took the Second Squadron, less Troop G, and set off joyously on his mission. Troop G was held ready to send after him if he ran into more opposition than had been estimated.

### Enemy In Tiis River Bed

Major Blanning located the enemy after dark in the Tiis River bed on Trail 41. Plans were made to attack at dawn and the squadron settled down to wait. When the attack was launched at daybreak, however, only a half dozen Japs were found in the thicket where they had been concealed. The balance had slipped away under cover of darkness leaving these few to deceive our force. Blanning was not long at a loss. Patrols were immediately sent in all directions with orders to report to Blanning as soon as the enemy was located.

Captain Wrinkle, who had relieved Captain Wheeler as Commanding Officer of Troop E-F when the wound received by the latter at Moron forced his hospitalization, took a patrol in the most likely direction of flight and soon located what he assumed to be the fleeing Japs in front of a battalion of the 71st Infantry near Bagac. The Japs had evidently slipped through the lines in the dark and were now in a ravine between the 71st Infantry position and their front-line wire, well within sight of their own troops to the north. Wrinkle's fire combined with that of the 71st held them pinned down, however, and word was sent to Blanning who hurried up with the balance of his force.

Major Blanning, hurrying forward with his advance guard, was ambushed by a considerable force of Japs hidden in the jungle thickets in the rear of the 71st Infantry. It now became obvious that the enemy located by Wrinkle was only a small part of the hostile force. Blanning was pinned to the ground with the point of his advance guard, but by hand signals to an alert NCO in his rear he managed to move a light machine gun squad around the flank of the enemy position and relieve the pressure.

After that, it was all over but the celebrating. Blanning moved in with his entire force and wiped out all opposition, then stormed up the ridge to the 71st Division position and down into the ravine. Captain Wrinkle joined to lead the rush into the ravine and was killed at the head of his men. Seventeen dead Japs were counted in the ravine in front of the 71st Infantry and over 60 in the thickets to the rear. No prisoners were taken. Blanning's losses were one officer and one noncommissioned officer killed and two men wounded. His total force did not exceed the enemy in numbers. Our losses, however, were hard to bear because of the value of these two men to the regiment.

After this little flurry of excitement, the regiment again settled down to its routine of training and reconnaissance until every officer and noncommissioned officer in the command was completely familiar with the maze of trails in the I Corps sector and the units were thoroughly trained in the jungle warfare tactics which had proved their value in Major Blanning's little engagement.

General Wainwright on March 12, became Commanding General Luzon Force when General MacArthur left for Australia on orders of the President. Soon after assuming command, General Wainwright designated the 26th Cavalry as a part of Luzon Force Reserve and we were ordered to bivouac at Bobo Point where we moved by marching the night of March 15 and 16.

The regiment was no longer attached to I Corps, but might still be called on to assist units of that force if needed. The regiment now also might be required to operate on the east coast in II Corps sector, however, and permission was requested to send reconnaissance parties to the east coast to continue the work of familiarization already done in I Corps sector. This permission, unfortunately, was refused due to lack of gasoline and when the regiment next went into action it was on the east coast, in unfamiliar terrain, and in conjunction with troops with whom we had not had the constant friendly contact which we had had with all I Corps units.

Late in March, G-2 reports began to indicate that the enemy was preparing for a great and final attack. The quiet of the past six weeks obviously could not go on forever. Our troops were ill-prepared to resist an all out attack. Their ranks thinned by malaria and dysentery and those remaining weak from malnutrition, none of the front-line divisions were able to put up more than one thin line to oppose the foe who had been gathering strength for over a month. It looked as though the time of decision was at hand.

Reports of heavy shelling and a minor breakthrough on the left of the II Corps reached our Headquarters on April 2. On April 3, the regiment was ordered to the junction of Trails 8 and 9 prepared to counterattack on right of the I Corps and cover the Pantingan River, or to attack on left of II Corps east of that river. The regiment moved after dark in busses and took over the bivouac of a battalion of the 45th Infantry (PS) which, with the balance of the regiment, had been ordered to support General Parker's left by an attack northward along Trail 29. This bivouac was not as satisfactory as that on Trail 17, but was nearer the scene of action and well placed to cover the right flank of I Corps, should the attack of the 45th Infantry not be successful.

A reconnaissance and contact detachment, under Major H. J. Fleeger, consisting of Troop B and one section of scout cars, was dispatched to contact the 45th Infantry and to keep the 26th Cavalry advised of the progress of their attack. Major Fleeger located the rear echelon of the 45th Infantry Command Post, but the jungle was so thick and the terrain so rough that

even these officers did not know what progress their regiment was making.

### Major Breakthrough On II Corps Front

Late in the afternoon of April 6, news came from Luzon Force Headquarters that a major breakthrough had occurred on the II Corps front and that the 45th Infantry attack had bogged down and been by-passed by the enemy. Trail 8 now was either cut or about to be cut and was not safe for travel. The 26th Cavalry would move by busses supplied by I Corps Motor Pool, via Mariveles to the junction of Trails 2 and 10 just west of Limay and there await orders in Luzon Force Reserve. Before the regiment pulled out word was received that the Mt. Samat position in General Parker's center had completely folded and the situation there was obscure and probably critical.

The regiment moved out at 7:30 P.M. in charge of the Regimental Executive Officer, Lieutenant Colonel Trapnell. Colonel Vance and the S-3 went ahead in a Command Car to Luzon Force Headquarters and then to junction of Trails 2 and 10 in order to obtain as much information as possible and to pick a bivouac before the arrival of the regiment.

Colonel Vance arrived at Luzon Force Headquarters at about midnight and found the Chief of Staff, Brigadier General Arnold Funk, and the G-2 and G-3 sitting before the situation map. They were unable to give a detailed picture of the situation due to almost complete breakdown of front-line communications. What information they did have was not encouraging. It appeared that Brigadier General Clifford Bluemel's sector had received the brunt of the attack which had pierced the lines near Mt. Sumat and was now hammering away at the shoulders of the gap. General Bluemel's thin line of undernourished and exhausted Philippine Army troops and those on his left were unable to withstand the vigorous attacks of fresh, well armed Japanese troops and the line had collapsed in great confusion.

The 45th Infantry attack east of the Pantingan River had been stopped and Trail 8 cut thus isolating the 45th from the bulk of the II Corps troops. They had attempted to cut their way through the enemy astride Trail 8, but without success. The 57th Infantry (PS) and 31st Infantry (US), the last available reserves except for the 26th Cavalry, had been thrown in to help General Bluemel, but no definite word had been received from either regiment or from General Bluemel for several hours. That was all the information General Funk could give us. The 26th Cavalry would proceed as ordered to the junction of Trails 2 and 10 and await orders. As soon as General Funk received more definite information on the situation our regiment would be committed. It was obvious, although no one put it into words, that the defense of Bataan was about over.

Colonel Lee C. Vance, 26th Cavalry Commander, proceeded from Headquarters Luzon Force to the regiment's assigned area on Trails 2 and 10. No proper bivouac area was available except a large mango grove.

Unlike the I Corps sector, this east coast area was not jungle covered. It was open and rolling, sparsely covered by low bushes and dotted here and there by large mango groves. In the absence of other cover, those groves always drew hostile artillery fire and bombing, but in the dark no other cover was found and it was imperative to get the regiment out of sight before daylight. The regiment arrived just as day was breaking and managed to get under cover without being spotted.

Orders were received at about 11:30 on April 7, directing the regiment to report to General Bluemel "Somewhere north of Trail 10 on Trail 2." This was the most definite information available and the last we were to receive from Luzon Force. Colonel Vance and the S-3 again moved out by Command Car and the regiment followed in approach formation led by Colonel Trapnell. Upon arrival at our scout-car outposts on a hill about two kilometers north of Trail 10, further advance by vehicle was stopped by a large bomb-crater in the trail. Colonel Vance remained at the outpost to await the arrival of the regiment and the S-3 continued on foot to find General Bluemel.

About a kilometer farther north, the S-3 encountered General Bluemel on foot carrying a rifle and accompanied by two Philippine Army Staff officers. He was moving slowly and reluctantly southward listening to small-arms fire about a half kilometer to the north. He had lost all contact with his troops sometime before when his last line was broken, but said that his troops should be withdrawing through the jungle on either side of the trail. Upon learning of the addition of the 26th Cavalry to his forces, he cheered up a bit and determined to place the regiment in position on the high ground where our scout-car outpost was then located in order to halt the enemy long enough to reform his scattered units. Accordingly, the S-3 led General Bluemel to where Colonel Vance was waiting with the regiment which had meanwhile come up under Colonel Trapnell. The Second Squadron was placed in position at once with the First Squadron about a kilometer to the south. The regiment was again prepared to execute the delaying action with which it had become so familiar.

Units of the 31st Infantry (US) began to drift in toward the trail from the surrounding jungle and they were directed to an assembly point on the high ground just south of the Mamolo River. Messengers were sent to the 57th Infantry (PS), which was still holding a line to the northwest of the junction of Trails 2 and 10, informing them of the situation and of the new assembly point.

### Enemy Close on 31st Infantry's Heels

The enemy appeared close on the heels of the 31st Infantry and were stopped by the Second Squadron line. A lively battle ensued, but did not last long as the

position was soon outflanked on both sides by the greater number of enemy. The Second Squadron withdrew through the First Squadron's line and took up another position just south of Trail 10. The First Squadron was in time outflanked and had commenced its withdrawal when a storm of interdiction fire fell on the junction of Trails 2 and 10. This combination of artillery fire and dive bomber attacks was continuous and much more severe than anything the regiment had ever gone through before. Fortunately, the Second Squadron had already passed the junction and Regimental Headquarters, the scout-cars and Bren gun carriers were almost clear when the firing began.

All trucks and other heavy vehicles had been started for the East Road and an assembly area at Rodriguez Park several minutes earlier and only an ambulance and two Bren carriers were lost. The First Squadron caught the brunt of the fire and was forced to pass the junction on either side by short rushes of small groups. Even so, casualties were high and a much reduced Troop A and a portion of Troop B were all that reached the Mamolo River. The north side of the Mamolo River Valley was very steep and only a narrow one-way trail for motors had been built by the engineers. Here an ammunition truck was hit on the narrowest portion of the trail and set afire, thus completely blocking it for motor vehicles, and necessitating the destruction of three scout cars that were caught behind the obstruction.

General Bluemel had gone to the assembly point on Trail 12 south of the Mamolo with Colonel Vance. There he met the commanding officers of the 31st Infantry (US), the 57th Infantry (PS) and the 14th Engineers (PS) and held an immediate conference. General Bluemel, in the absence of orders from II Corps, decided to withdraw to the southern bank of the Alongan River, breaking contact with the enemy at night if possible, and thereby gain time to organize a new position with his scattered troops. An order was issued about 2 P.M. giving the order and route of march and, inevitably, assigning the rear guard position to the 26th Cavalry.

By this time night had fallen and the enemy advance had stopped except for nuisance patrols of snipers and noisemakers. The column was formed and the march began. The Second Squadron remained in position until midnight to deceive the Japanese patrols and then followed the column, reaching the Alongan River at daybreak.

Due to a confusion of trails, the units of General Bluemel's command had become separated during the night and although all were on the Alongan River by daybreak their positions were not exactly as planned. The 14th Engineers were on the left of Trail 20 on the high ground south of the Alongan. The 26th Cavalry was on the right of Trail 20 and in contact with the 14th Engineers. There was a gap of almost a kilometer of practically impassable jungle between the 26th Cavalry's right and the left of the 31st Infantry and then another gap between their right and the 57th's left. Colonel Jack Erwin more or less continued the line with a mixed force on the East Road and to the east of it. There was absolutely no communication between these separated units except by dismounted messengers who required hours to make the round trip.

General Bluemel was with the 26th Cavalry on Trail 20 and had adopted Colonel Vance's staff as his own and appointed Colonel Vance as his executive. Major Jones pulled a telephone out of thin air and managed to get contact with Major Ralph Rumbold who was holding down a telephone in the recently evacuated advanced CP of II Corps. Major Rumbold was just preparing to leave himself when Major Jones contacted him. He remained alone at his self-imposed station throughout the day, and relayed General Bluemel's messages back to II Corps.

Telephone contact with II Corps was of little or no value, however, as they were unable to send help or furnish information. General Bluemel was placed in command of the entire line by General Parker, but this was of no practical use as the only units General Bluemel could contact were the 14th Engineers, the 26th Cavalry, both in his immediate vicinity, and Company G, 57th Infantry which had become separated from its regiment and was now held by General Bluemel in rear of the 26th Cavalry as his only reserve.

General Bluemel was in an almost complete state of physical exhaustion but, refusing to spare himself, personally supervised the preparations made by Colonel Vance and Lieutenant Colonel Frederick Saint, Commander of the 14th Engineers, to meet the inevitable attack. The positions of the two units were coordinated and a roadblock, improvised from a disabled 155mm gun, was placed on the precipitous trail leading up from the Alongan River and covered by fire of a detachment of Troop B. An officer patrol from Company G, 57th Infantry was sent to contact the 31st Infantry on the right. The patrol was gone for several hours and returned in midafternoon to report that the 31st was in position but that the gaps on both its flanks were wide open although no trails ran through them. Inasmuch as absolutely no troops were available to close the gaps, it could only be hoped that the enemy would stick to the trails.

### Jap Dive Bombers Cause Casualties

During the afternoon, enemy dive bombers could be seen thoroughly working over Colonel Erwin's position and he reported to II Corps that he was suffering so many casualties that he could not hope to stop even the lightest of attacks. General Parker had managed to scrape up one battalion of Philippine Constabulary which he planned to send General Bluemel to plug the gap between the 26th Cavalry and the 31st Infantry. This was now diverted to support Colonel Erwin but it is doubtful if it got there in time.

A battery of Lieutenant Colonel Joseph Ganahl's self-propelled 75s arrived early in the afternoon, led by Colonel Ganahl himself who placed his guns in position to cover the high ground north of the river. With artillery support for the first time in the war the 26th Cavalry began to feel that the forthcoming struggle might not be so one-sided after all. Unfortunately, enemy tanks were reported on the East Road and Ganahl's guns were ordered by II Corps to meet the new threat just 30 minutes before the Japs hit our lines. We were fated never to have that artillery support. It is doubtful if the guns ever reached the East Road and the tanks turned out to be ours anyway.

The tanks that appeared 30 minutes later, at about 4 P.M. on our front were decidedly not friendly. They opened fire promptly with machine guns and 47s, a wickedly high velocity weapon which burst in your midst before the sound of the gun's report reached you. These were soon bursting in the bamboo overhead by scores and doing a good job of keeping our men's heads well down.

The tanks, fortunately, were stopped by our roadblock but Japanese infantrymen by the truckloads were following in the rear of the tanks and they were soon swarming over the terrain to the front. It was not long before our exposed right flank had to be refused in a right angle due to Japanese groups penetrating the gap between our right and the 31st Infantry. Darkness again saved us from complete encirclement and General Bluemel decided to withdraw under cover of night and try to find another position some distance to the rear.

The withdrawal from position was made without untoward incident although enemy forces were well around to our right and rear. Near the junction of trail 20 and trail 24 the column was increased by units of the 31st Infantry (US) which had been forced to withdraw from its position by enemy forces penetrating the gap on its left flank.

Troop G, acting as rear guard, received a report that enemy tanks had come in from Limay and were now between it and the main body which had gained distance in the darkness. To avoid these tanks, reportedly moving toward him, Major Blanning who had been marching with the rear guard, moved Troop G into the jungle to the right of the trail and was soon well lost. He decided, after floundering around in the dark for sometime, to halt until daylight.

Meanwhile General Bluemel, leading the column on the main trail, had met a courier from Luzon Force Headquarters who informed him that General King would surrender Bataan the following morning, April 9. The news was a blow although by no means unexpected. It was obvious that if trained regular army units such as the 26th Cavalry, 31st, 45th and 57th Infantry and the 14th Engineers were in a situation as muddled as ours then the less well-trained and less well-armed Philippine Army Units must be in the last stages of exhaustion and disintegration, regardless of their spirit and courage. General Bluemel determined to get the remnants of his force as far as possible out of the path of the attacking Japanese front-line troops who might not receive the news of the surrender promptly. Accordingly, the movement southward was resumed at daylight with the 1st Squadron 26th Cavalry as the advance guard.

Shortly before 11 A.M. April 9, the advance guard ran into a strong Japanese force which had evidently passed our column on the right of the trail during the night by what must have been a gruelling march through the jungles on the east slopes of Mt. Mariveles. The First Squadron was soon engaged in a fire fight. The opposition of the enemy indicated a large force, later determined to be about a regiment supported by small mountain guns, and General Bluemel reluctantly decided to send forward a white flag in hopes that the hostile unit had heard of General King's surrender. Whether or not they had was never determined, but they did accept the surrender.

Meanwhile Major Blanning, marching with Troop G a few kilometers to the northwest but off the main trail, had run into two military policemen who told him the news of the surrender. He determined to try to reach Signal Hill on the southwest slope of Mt. Mariveles but in several hours of gruelling marching he failed to find a trail leading there. Many other stragglers were encountered in the hills, however, all of whom confirmed the story of the surrender. Major Blanning was faced with the question of whether or not to lead Troop G to the main road and turn them over to the Japs or disperse them in the hills. The men were given an opportunity to express their preference and elected to trust to the jungles rather than the Japs, a thoroughly wise decision.

Thus ended the 26th Cavalry (PS), the last cavalry regiment in United States history to go into action on their traditional mount, the horse. A regiment with no combat history prior to this war but with a well earned right at the end of it to hold its head proudly in any company. From Damortis to the last organized stand on ill-fated Bataan, it had fought courageously, steadfastly, and efficiently to uphold the finest military traditions of both countries from which its members were drawn.

This history is presented with a heartfelt hope that the reorganized Philippine Scouts, recently ordered by General MacArthur, will not fail to include in its roster of regiments the name of the 26th Cavalry which gave the last full measure of its devotion to duty, and country in the defense of the Philippine Islands. Such hard won honors and traditions, garnered on the field of battle, are a regiment's heart and soul. It is hoped that this record will be a prized possession of a new and rejuvenated 26th Cavalry (PS).

Yes, they wrote their names in Filipino history with blood.

# Plan For Philippine Army Armored Units

*by Major M. Azurin**

**The Philippine Army never had and, at present, does not have a single armored unit. This article presents a suggestive plan for an armored unit that might be organized by the Philippine Republic. The author of this article emphasizes that the ideas presented are his personal opinions and that he does not speak for the Philippine Army or Government.**

DURING the past war mobile warfare has developed to such an extent that almost all armies of any consequence have relied on their armored force for their striking power. The Germans overran Poland, France, Belgium and the Lowlands with their Panzer divisions during the first phase of World War II. The American Army, on the other hand, did a better job of overcoming all German resistance with their armored force.

The French Army just after the first World War believed that they would have to build elaborate fortifications to keep away from French soil any invading force. They were convinced that with a network of concrete pillboxes and trenches on their border they could ward off any enemy attack. They put much faith on stabilized warfare, on defense, and built their Maginot Line. They suffered the consequences of their lack of foresight during the recent war. The Germans did build, also, their line of fortifications by constructing the Siegfried Line. They did not place their safety on this alone, though. They went further and built their mobile striking force—their Panzer divisions.

The Philippines, with a coast line longer than that of the United States, aside from financial considerations, cannot possibly build pillboxes, not to say, fortifications all alongs its coastline. That will be next to impossible. General MacArthur, as head of the American Military Mission in the Philippines, in his report to the defunct Assembly of the Commonwealth regarding his plan for a Philippine defense, said in part: "In order to defend the Philippines with any degree of success, it must have a highly mobile striking force." He conceived and built the Philippine Army with this objective in mind. But his work was half done when the war broke out in the Pacific and he had to use what Philippine Army foot troops he had so far trained, to ward off the Japanese menace. If he had been able to realize his plan for a highly mobile army, I believe without any fear of serious contradiction that the result of the Battle of the Philippines would have been a different one.

To emphasize the necessity of a highly mobile army to defend the Philippines, I will cite an instance on the outbreak of the war in the Philippines. The 26th Cavalry (PS), was engaged in a mission of delaying the enemy from Lingayen Gulf to Bataan. It was a magnificent delaying action. Yet, it could have been more effective had it been an armored unit instead of a horse-cavalry. This regiment was pitted against Japanese

*Philippine Army Officer.

tanks and before it got engaged with the enemy the result was foregone—annihilation. So much valor and lives were sacrificed and lost for lack of armor.

In this article I do not have the intention of talking for the Philippine Army, much less for the Philippine government. This is only a suggestive plan for any armored unit that might be organized and whatever ideas embodied in these pages are purely my personal opinions based on what I have learned and observed in The Armored School at Fort Knox.

The Philippine Army never had and, at present, does not have even the smallest armored unit to speak of. To keep up with modern trends of warfare and to correct errors in the past, it should have an armored unit. In planning the organization of this unit there are several major functions to consider, namely:

1. Finances.
2. Philippine terrain and weather.
3. Roads and bridges.
4. Organization and setup of the Philippine Army.
5. Training of personnel.

The present state of finances of the Philippine government is such that it will be inconceivable to plan a large armored unit. Nevertheless, money consideration should not deter us from putting up one. I am firmly convinced of the soundness of such an investment. Every peso spent in this undertaking will be fully paid back in the future in terms of lives and national security.

To begin with, vehicles, equipment, radio sets, tools and spare parts for a light tank company may be purchased. Needless to say, this will be a modest beginning but it will be in the right direction considering the dearth of trained personnel to man and maintain this equipment. The initial sum of P1,000,000 ($500,000), the approximate cost of 17 M-24 tanks and accessories and tools to operate and maintain them may be set aside for this purpose. With an eye to economy and to other considerations which will be discussed in subsequent paragraphs, the light tank will best suit our particular situation. As personnel get trained, additional tanks may be purchased. A gradual acquisition of equipment is more desirable rather than a wholesale purchase for the obvious reasons of lack of personnel to operate them; it will be less burdensome to the national purse and it will give the Army opportunity to be equipped with modern tanks that might be developed in the future. Purchase and use of a few medium tanks may be considered later after a special and definite purpose for their employment has been worked out and decided.

In figuring out the appropriation for the establishment of an armored unit, cost of maintenance of equipment should not be overlooked. In the past, before and after the war, it was my sad experience to have worked with maintenance units which were so ill-equipped and poorly supplied with the barest necessities in tools and spare parts for weapons and vehicles alike that deadline equipment had to be brought to private maintenance shops. Such deficiency may be corrected by an increase in the appropriation for tools and spare parts. The army cannot leave to chance the maintenance of any mechanized unit by makeshift and niggardly appropriations. Neglecting maintenance of vehicles, weapons and radio sets will certainly lead to very serious consequences during war.

The most important factor influencing the selection of the type of tanks to be used in the Philippines is the terrain and the weather conditions. The Archipelago, except in Central Luzon, has narrow coastal plains, mountainous, and is thickly vegetated with tropical growth in the interior of the islands. Unlike other countries, it has no rolling terrain. In other islands, like Mindanao, the terrain is broken by steep-banked rivers and deep ravines. The central plains, roughly 150 miles long and 80 miles wide, would be suitable for tanks but tank operations would be limited to the dry season of the year. The operation of tanks in this part of Luzon during rainy seasons would be restricted to the roads. In the narrow coastal regions, the radius of tank operations would be considerably less. And during wet seasons, tanks would be road-bound.

The M-24 tank is light, has a narrow hull, has speed and mobility. These characteristics of tanks will determine to a considerable degree the choice for the type to be adopted in the Philippines. Armor and fire power are also desirable qualities. But the weight that goes with them makes it impracticable for the use of tanks with such qualities. Our narrow and lightly constructed roads and bridges will bar their use. In the event that we have to fight during the rainy season the light tank will have more chances of moving around and surviving in the mud and muck of rice paddies than the medium or heavy tanks. The limited number of tanks that the army may be able to put up is another reason why these tanks should have speed and mobility. Units will have to be moved long distances to meet invasions or attacks at widely separated places. Considering all these factors—terrain, weather, narrow roads and light construction bridges, speed and mobility of tanks —they all point to one choice—the light tank. True, it has its drawbacks; it has thin armor and low muzzle velocity of its 75mm gun. But I have hopes that in the near future improvements on this tank will incorporate the 76mm gun and more armor to it.

The armored units that will be organized should conform to the tactical organization of the Army. To get the utmost benefit and combat efficiency of tanks, they should be highly integrated with the infantry.

Working on this premise, I would venture to make an analysis and suggestion as to the size of these units and just where they fit in. I am not a tactician, not by any stretch of the imagination. I do not presume to know much about tanks, either. However, to fully understand the question of where and what size will

our future armored units be, a brief study of the Philippine Army organization is necessary. The Army is basically infantry. Its Regular Force has a strength of 37,000 officers and men. This number might gradually decrease when peace and order in some parts of the country has become normal. The decrease, I believe, will not affect as much the Regular Force proper as the Military Police Command which is purely a constabulary unit of the Army. With the present move of Army Headquarters of reorganization, I have hopes that an infantry division may be formed out of the loosely integrated arms and services. If and when an infantry division is formed, a tank unit may be incorporated into the divison.

I am convinced that the place of an armored unit is in a regularly organized command; in this case the infantry division, and not under the General Headquarters of the Army or anywhere else. Training and tactical employment demand that this armored unit should be administratively and tactically under the infantry division. Granting this to be the case, the next question is: how big will this unit be and where will it come in to the over-all picture of the infantry division? Any attempt on my part to answer definitely these questions will be indulging in presumptions. Needless to say, the final answer and decision will be in the hands of the War Plans Section of Army Headquarters. However, my suggestion is: it should be a tank battalion. The tank battalion is the smallest tank unit that can support to an appreciable degree the three infantry regiments of the division. A tank company is too small and a unit bigger than a battalion will be beyond the financial reach of the government. Like the field artillery regiment or the engineer battalion, the tank battalion should be an organic part of the division. The battalion commander exercises staff function in the division and command in the battalion. The tank battalion shall consist of four light tank companies instead of only one of the standard medium tank battalions. The incorporation of the tank unit into the division will add to what fire power the division has, the shock effect, and armored fire power of the tanks.

Thinking in a different vein of thought, say, creating a separate armored division will be more in the realm of wishful thinking. The cost of the equipment of an armored division, not to say the cost of their maintenance, will be prohibitive. What our Army needs now are small tank units that can be integrated with existing infantry organizations. To build now or even to plan a war machine the size of an armored division will invite much skepticism. When the Army has grown in size, then and only then will an armored division be warranted.

Having decided what type and what size the tanks and tank units will be, the next problem for the Army headquarters will be the training of personnel. Training of personnel cannot be overemphasized. Key officers and men should be thoroughly trained before they can train in turn the men in the companies. The best and only place for these officers and men to be trained will be in The Armored School at Fort Knox, Kentucky. It is regrettable that the Philippine Army is sending only two officers annually to this school and that it has not sent them earlier than last year. Whereas, it is sending more than double this number to other lesser U. S. Army schools.

Evidently, the importance of the role of armored units in battle is not yet thoroughly appreciated by our Army. To accelerate the organization of the armored unit, more officers and men should be sent to The Armored School. A quota of two officers in the Basic Course, one officer in the Communication Course, one officer in the Motor and Track Vehicle Course and four enlisted men in the noncommissioned officer course should be detailed to this school every year with the permission of the U. S. War Department, of course. With a complement of thoroughly trained key officers and men, the Army will then be ready to take in additional men to fill up the units to table of organization level. The job of turning out and moulding these green men to efficient tankers and tank crews will rest in the hands of these officers and men.

The first obstacle that they will be confronted with in their instruction will be training equipment and aids. Training equipment, aids and diagrams should be procured first before an attempt to teach the highly technical phase of instruction is made. The second obstacle will be range facilities. Ranges must be located where service firing of small arms and tank guns and tactical field exercises may be done without endangering persons and private property. In Luzon this will be a real problem considering the area involved in this type of range and the fact that most rolling terrain in Luzon is parceled and owned by private individuals. Other minor difficulties in training will spring up so that officers and men responsible for training must foresee and surmount them. Careful planning and preparation will insure a high degree of training.

Summarizing the preceding paragraphs; plans for a Philippine Army armored unit should take into consideration: (1) the appropriation available for the procurement of equipment and for their maintenance, (2) Philippine terrain and weather, (3) effect of narrow and lightly constructed roads and bridges on tank operations, (4) contemplated tactical employment of tanks and (5) training of personnel. After having considered all these factors the logical conclusion would be that a tank battalion of light tanks as an organic part of the infantry division would be the most appropriate tank unit under our financial, topographical and tactical circumstances. Additional tank battalions may be formed later as divisions, regular as well as reserve, get organized.

In conclusion, the creation of an armored unit will be a step toward making the Philippine Army a more potent guardian of our national integrity and security.

# GUERRILLA WARFARE IN LUZON

*by Major Jorge A. Sanchez**

GUERRILLA warfare is an accepted phase of modern fighting. It is resorted to by a people whose means for organized resistance against an invader have been reduced to the minimum. In it is manifested a nation's stubborn refusal to admit defeat or impending defeat. More often it is inspired by hopes of ultimate victory.

The primary aim of guerrillas must be to harass the enemy. The enemy's efforts to completely subjugate a locality and to institute therein an effective political and economic control must be opposed vigorously. In this manner he will be made to realize that the locality is still unconquered; the spirit of resistance against him is still prevailing. Thus, he is prevented from withdrawing his forces which, otherwise, may be employed elsewhere.

Guerrilla warfare is not unknown to the Filipinos. During the Filipino-American War, after the major forces of the Philippines had been destroyed in the field and even when all hope of victory was gone, the people continued fighting. The military leaders sought refuge in the mountains where plans for continued resistance were formulated. People in the cities became intelligence agents, and farmers in the valleys provided the guerrilla armies with needed food supplies. Women and children were in the fight. It was more than three years after American sovereignty had been firmly established in the Islands that the last guerrilla leader surrendered and the guerrilla resistance finally ended.

## The Island of Luzon

The island of Luzon is the largest geographical subdivision of the Philippine Archipelago. Its valleys and plains are the most extensively developed agricultural regions of the country. Its mountains treasure vast stores of natural resources. Beneath the ever-green foliage of the mountain trees are rich mineral deposits such as, gold, iron, copper, silver and manganese. Its cities are the centers of Philippine industries. It is obvious, therefore, that the control of the island of Luzon is most essential to the control of the whole Philippines.

The city of Manila, the political, educational and commercial center of the country, is the capital city of the Philippines. Manila is the nerve center of all Philippine activities. It is here that political and military undertakings are planned, coordinated and initiated. In addition, the Japanese used the city for a vast supply and replacement depot for his scattered armed forces. The city of Manila is located on Luzon.

The foregoing attributes of the island of Luzon made it the most fertile and profitable ground for guerrilla activities in the Philippines. But due to the incessant military activities which necessitated a greater degree of vigilance on the part of the Japanese than in other regions of the country, Luzon became, likewise, an unhealthy place for guerrillas.

## Guerrilla Activities Before Bataan Fell

The situation in Bataan was hopeless. The soldiers in Bataan and the people all over the country knew it. Every time they turned in their radios, Filipinos living far remote from the scenes of battle expected to hear the terse announcement that Bataan had fallen. Yet, in every home, even while the inevitable was expected, the people prayed for a miracle that could save that last bastion of hope. They prayed and hoped that the hungry and disease-ridden but valiant army that faced the invaders might stay the tightening claws of death and defeat.

But the soldiers in Bataan were not fighting alone. Long before the guns of Bataan were silenced, long before the heroic defenders had died or lived in surrender; the people in the cities, in the valleys, in the hills—in enemy occupied or unoccupied regions—prayed, hoped, and fought.

In Meycauayan, 13 miles north of Manila, civilians armed with rifles, pistols and shotguns, ambushed a Japanese advance guard. Fighting lasted several hours. Japanese planes, artillery, mortars, and machine guns, played havoc among the poorly armed civilians. Many Filipinos were killed. But many Japanese also died. The fall of Bataan was stayed a few hours longer.

The Japanese entered the city of Manila on January 2, 1942. That same day a Japanese patrol of more than 20 men left their company never to return. The next day another patrol—this time about 60 men—ventured too far in the night. No man was seen alive again. The defenders in Bataan reckoned with the enemy minus

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*Philippine Army officer attending The Armored School.

80 men.

All over the plains of Luzon rice and sugar cane fields burned. Towards the hills, cattle, hogs, carabaos, and horses were driven. In the towns and in the cities people cried and were sorrowful; but while crying, feasted on fried or roasted beef, pork and chicken, eggs and other delicacies. They ate until they could eat no more and then threw into garbage cans the leftovers—leftovers that even now after the war would adequately grace a feast table. No, the people of the Philippines would not feed the conquerors.

There were reprisals. The Japanese forces were treacherous in their strategy and ruthless in their reprisals. People were hog-tied and beheaded or shot. Innocent blood was spilled. But barbarity portrayed the weakness of the enemy. Reprisals reaped hatred and boundless contempt. Every Filipino murdered was a dry twig thrown into the mounting flame of detestation. Every Filipino dead was mourned for and every mourner thirsted for revenge.

### When Bataan Fell

Bataan fell. The inevitable came; yet when it did, it came as a shocking surprise. Surprise, because Bataan seemed the only hope, and hope cannot just fade away. Hope was victory!

Before Pearl Harbor the Filipinos knew that if there would be war, Japan could not win the war. Yet, on this fateful day—April 9, 1942—Bataan fell and the war seemed to have been lost and the Japanese the victors.

But this could not be so. This could not be defeat! The Japanese should not be the victors. The fight must go on and defeat would be the watchword of victory. Remember Bataan!

The horrors of the "Death March" were imprinted in every Filipino mind. The brutalities in the concentration camps became known to everyone. The overbearing manners of the Japanese military yielded abhorrence.

Many survived the "Death March" and the concentration camps. Many did not surrender at all. Armed with the knowledge of Japanese brutalities and a much more intense hatred of the enemy, these battle-wise veterans augmented the guerrilla ranks.

Thus, a new hope was born. A new impetus was added to the resolve to win. A bigger bunch of dry twigs was thrown into the flame.

### Guerrilla Organization

By the middle of 1943 there were more than a dozen poorly armed but well organized guerrilla bands in Luzon. Each of these bands was distinct from the other. Nevertheless, their organizations, policies, and lines of actions differed but slightly. There was one common enemy. There was but one common cause. Methods varied but the objective was the same—Japan must be beaten.

In the ranks of the guerrillas were laborers, farmers, lawyers, doctors, engineers, soldiers—men of every profession and social standing. They were men and women, young and old. They were parents, children, widows, brothers and sisters of the hapless victims of Japanese atrocities. They were a people who once enjoyed the blessing of peace and liberty; who enjoyed life and sought happiness in their own individual ways. They were a people who hated war and its inherent ruthlessness; but who, because war had descended upon them, wanted a share of its horrors.

Unfortunately, the guerrilla bands were not united under a single command. Sectors of activity of one often overlapped that of the other. Coordination of actions was nil and duplication of efforts was prevalent. Most of the guerrillas were not professional soldiers. They knew nothing of the rudiments of war. All they knew was that they wanted to fight. Attempts were made to unite these guerrilla bands, but, due principally to the refusal of one leader to subordinate himself to another, these attempts failed.

### Sabotage

Guerrilla activities were confined mostly to sabotage, propaganda, and intelligence work. Open combat with the enemy was foolhardy and most often evaded unless the situation presented no other alternative. Arms were few and inferior to those of the Japanese and ammunition was available in only very limited amounts.

It is impossible to narrate here all the accomplishments of guerrilla saboteurs. A few illustrations are deemed sufficient.

In April 1943, a Japanese regiment in Baguio received orders to proceed by train to Manila from whence it would embark in troopships for some Pacific island. The train left Manila for Damortis early in the morning. A couple of hundred yards from the railroad station at Caloocan, the train was mysteriously derailed, the locomotive wrecked. The troopship left Manila Bay three days behind schedule. Japanese reinforcements arrived at New Guinea too late.

In the same year, 1943, Manila was visited by a storm. Japanese warehouse guards had no desire to get soaked in the heavy rain and relaxed their vigilance that day. Suddenly and simultaneously three warehouses in three different parts of the city were afire. Hundreds of drums of gasoline and oil perished in the flames. Japanese vehicles in Saipan stood still.

A Japanese tanker filled with oil to the limit of its capacity lay anchored out in Manila Bay. It was scheduled to leave for its destination in the Pacific the next day. The Japanese crew were enjoying their beer and their song. The sound of their voices reverberated in the waters around them. From the shore an empty wooden barge approached the ship unnoticed by the drunken crew. Suddenly the barge exploded; flames leaped high and into the ship. A few hours later the ship was no more. The crew had drunk their last beer.

Several truck loads of rifles, hand grenades, small arms ammunition and spare parts were unloaded one evening into a warehouse in Caloocan. The Filipinos around were very helpful. They carried the heavy boxes and piled them up inside the building. They asked no pay for their labor. The following night the warehouse was burned down, the guards dead.

### Propaganda

Fires of mysterious origins breaking out at very undesirable places enraged the Japanese. Stories of Japanese defeats, of American landings at such and such islands, of the approaching day of Philippine liberation, surreptitiously whispered from ear to ear enraged him no less. He became violently furious when he awoke in the morning and found the street in front of his quarters littered with wrappers of American chocolate bearing the ominous message, "I shall return."

Filipinos were forbidden, under the penalty of death, to listen to foreign broadcasts. During the early part of the occupation, radio receivers were collected. They were returned minus the short wave receiving unit. But there were Filipino radio engineers and there were those who were not afraid to die. Soon station KZEI in San Francisco became a favorite radio station.

But not every Filipino is a radio technician; not every Filipino home afforded safety to radio listeners. However, everyone hungered for war news; and everyone can read. In no time, carbon and onionskin papers were in great demand and people passed around typewritten war news. No newspaper was more welcomed in Luzon.

Inside the American civilian internment camp at Santo Tomas University, the newsette, "The Voice of the Underground," found way. Internees' morale rose to a new height. Privations became more endurable.

Later, the Japanese called the guerrillas "misguided elements." The newsette, thanks to the Japanese, had a more sarcastic name—"The Voice of the Misguided Elements."

The guerrilla propagandist accomplished his mission excellently. The importance of his work cannot be overlooked. For more than three years the Philippines was isolated from the rest of the world that was not Japan. Day in and day out the Filipino was fed with Japanese propaganda lies. He had been defeated. His children were sickly, hungry, in rags. His misery was unbearable. Cooperation with the conquerers meant medicine, food, good clothes—life. But the Filipino's loyalty to the cause wavered not. His stomach was empty, but his morale was high and hope deserted him not. Thanks to the guerrilla who listened by his radio and pounded at his typewriter.

### Intelligence Activities

Few Japanese understand English. Fewer still can comprehend any Philippine dialect. In order to make police work more effective, native spies should be employed. The spy was well paid, given extra ration, and issued arms. Handsome rewards were offered for the capture of guerrilla leaders. Many Filipinos volunteered to spy for the Japanese. Very few guerrillas, however, were turned in, and most of the information that reached Japanese hands was false and misleading. Espionage worked the other way. More information that was accurate and reliable sped across the seas, or traveled on ether waves, to Australia. More families enjoyed additional rations, and more guerrillas were armed.

Filipino laborers worked in airfields. They mounted antiaircraft guns in position and dug trenches for the Japanese crew. Native stevedores loaded and unloaded ships in the harbor. The Japanese had a saying, "An idle body breeds an evil mind." The Filipinos were kept busy. Then, almost daily, sketches of airfields and the number and types of planes therein; reports of ships in the harbor, including their time of arrivals, departures, loads and destinations; location and caliber of guns and the quarters of their crew; identification and names of commanders of units that arrived or left Luzon; poured into guerrilla headquarters. These intelligence reports were consolidated and transmitted to G.H.Q., SWPA.

It is unbelievable, but it is true. Most Japanese soldiers did not know, but Filipino laborers knew, that Yamashita was in the Philippines.

### Japanese Counter-Resistance Measures

The Japanese propaganda was an inexhaustible as it was preposterous and idiotic. Manila newspapers published incredibly successive Japanese "victories." The guerrillas had many moments of mirth.

Perhaps the only Japanese propaganda that caused a state of agitation in the guerrilla ranks was the promise of independence to the Philippines. The Filipinos have always cherished the thought of national freedom. If independence were granted, the guerrillas would suffer the loss of popular support and the resistance movement would crumble. But the state of apprehension existed only for a short while. "Independence" was granted, but the Japanese remained the masters of the country. Japanese military police continued to enforce military law, Japanese soldiers still confiscated rice and trespassed and looted Filipino homes; Japanese worthless paper bills remained the only legal tender in the land. It did not take long for the people, even those in the remotest barrios, to realize that the "Independence" was a farce and the "Philippine Republic," a puppet. More people came under the guerrilla banner.

The Japanese set up a "Gestapo" institution in the Philippines. Towns and cities were divided into "Neighborhood Associations," each association under a leader. Families must join the association to be able to draw rations. Every individual must register with the "neighborhood" and should secure the permission of, and report his departure and destination to, the leader

whenever he desired to leave the community. Every leader was required to report the presence of any non-member in his district. The Japanese thought he had a way of checking the activities of every Filipino. But he misjudged native ingenuity. Filipinos were "neighborhood" leaders. The population of the Philippines was less in 1943 than it was 20 years ago. There was always a way about the ration system.

Whenever the presence of guerrillas in a district was suspected, Japanese soldiers would swoop down upon the place. They would search houses and herd the male inhabitants into churches or school buildings. Here they would line up the men and order them to pass before a hooded spy. Guerrillas and guerrilla sympathizers would then be loaded into trucks and brought to Fort Santiago. Many guerrillas were captured in this manner. Frequently, though, the guerrillas had fled and the town was empty when the Japanese arrived.

Behind the grim walls of Fort Santiago, guerrillas were subjected to most inhuman torture. Few came out of the Fort alive. Those who survived the inquisition came out maimed—pitiful human wrecks. But the Japanese did not choose wisely when they elected Fort Santiago to be the chamber of human sacrifice. The Filipinos have always linked Fort Santiago with freedom. It was here that the greatest Filipino hero, the father of Philippine nationalism, Dr. Jose Rizal, was imprisoned and tortured by the Spaniards. The threat of Fort Santiago, therefore, contributed more to the people's determination to resist the enemy.

### Guerrilla Activities During Liberation

The landing of American forces in Lingayen marked the beginning of the end of Japanese domination in Luzon. It also signified the change from passive to active guerrilla resistance in the island. The day of reckoning had arrived. As American might rolled on nearer, the people rose up in arms. Fighting broke out everywhere. Bataan was avenged.

The Japanese forces entrenched themselves inside the city of Manila. Others withdrew to the mountains east of Manila and around Baguio. The guerrillas knew these mountains. They know every cave and every trail by heart. The mountains were the former hideouts of guerrillas. Guerrillas, therefore, proved excellent guides to the United States forces that sought out the enemy.

The story of Manila was different. The Japanese felt secure in their trenches. They fought like cornered animals determined to kill or be killed. Every concrete buildings was a Japanese fortress. Every avenue of approach was blocked. Every bridge was blown. The guerrillas knew all these. They knew every pillbox, every street barricade, every gun position. They knew the enemy strength; the identity of units. Even while the American forces were miles away from the city and while the Japanese were preparing the defensive installations in Manila, guerrillas were drawing sketches of these installations and forwarding the sketches and other intelligence reports to headquarters of United States forces. The forces of liberation were well supplied with information about the enemy.

Guerrillas fought in the front lines, too. They were attached to American units; were issued uniforms, equipment and arms. In numerous encounters they were beside the forces of liberation fighting fiercely and enjoying the fight. And, when after the day's combat, the forces went into bivouac, the guerrillas manned outposts and stood guard to secure the area from counterattack by the enemy.

### Conclusion

The mission was accomplished—the job well done. Again man can go about and seek happiness in his own individual way. Gone was the threat of torture, of horrible death. Gone was the dreaded Japanese military police. No longer would soldiers break the tranquility of homes. The victims of Japanese brutalities have been avenged. The cause for which they suffered and died was won. Now they can rest peacefully in their graves.

The accomplishments of the guerrillas cannot be underestimated. Indisputably, their unquestioning devotion to the cause, their unconquerable spirits in the face of defeat, their valiant resistance against the enemy when resistance seemed hopeless, contributed to some degree to the liberation of the Philippines and to the early termination of the war.

In acknowledgement of their service and of their invaluable contribution to the successful prosecution of the war against Japan, "recognized" guerrillas were incorporated into the Philippine Army. Unfortunately, however, many deserving guerrillas were left out in this matter of remuneration.

The United States Sixth Army promulgated a policy to the effect that only those guerrillas shall be recognized who can produce certificate of attachment with the United States Army units. This policy, perhaps, was sound, but certainly was faulty in foundation. During the three years of defiance against the Japanese and before the arrival of the American forces in the Philippines, hundreds of guerrillas have died in Japanese prisons or were killed in action. Needless to say, these dead guerrillas could not have been attached to any United States Army unit. Moreover, many guerrillas who joined and fought with American units were ignorant of this policy and did not bother to ask for certificate of attachment. When finally they came to know of this prerequisite to recognition, the unit to which they had been attached had been transferred elsewhere. If anyone deserves recognition for his sacrifice and labors, the guerrilla who made the extreme sacrifice or who was active in the resistance movement during the darkest days of the Japanese occupation, deserves it more. Perhaps, in the near future the omission will be rectified. Then the guerrilla, and the widow and orphans of the dead will not feel forsaken.

# Tank Destroyer Development

*by Major Ralph W. Lang**

**The primary mission of Tank Destroyers in World War II was the destruction of enemy armor. In this article the author discusses the development of TDs from the very beginning.**

ON September 16, 1915, the British introduced the tank into modern warfare. With the idea in mind that there is a defense against every offense, many minds on both sides were put to work at once to find a defense against this new weapon. The Germans developed the armor-piercing machine-gun bullet. Both sides, to a limited extent, employed field guns in a direct-fire antitank role. These were the major antitank developments during the war. At the end of World War I, the tank was still the king of the battlefield and could roam almost at will.

Antitank thought continued after the war and generally paralleled the development of the tank. Since the trend in tanks was toward the light type, this produced a light antitank gun, such as our 37mm gun. The Germans were the exception to this and unveiled the now famous "88" in the Spanish Civil War.

During the early days of World War II, the British found that the most effective defense against the German tank was ambush, since that enabled the antitank gunner to hit the tank on its flank which was more lightly armored. This was developed into defense in depth as we know it today. However, since they employed a light antitank gun, the heavily armored German tank, with its tactics of fire and movement was not subdued. It was further found that, for any one gun to survive the onslaught of the Blitzkrieg, it had to be supported by at least one other gun. These two principles—defense in depth and mutual support—have been the basis of all later antitank doctrine.

At the time of the German invasion of France, General George C. Marshall, World War II Chief of Staff, directed that a study be made with the view of finding an adequate defense against the tank. One of the consequences of this directive was the conception and development of the tank destroyer. Shortly after, the Tank Destroyer Center was opened at Camp Hood, Texas. The mission of the Tank Destroyer Center was not only to train the new tank destroyer units but to continue research along this line.

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Since all new ideas go through a process of change to gain the desired objective, tank destroyer matériel and doctrine underwent considerable change since the time it was first conceived. The first tank destroyer used in combat in Africa was the M-3 half-track mounting a 75mm gun. Due to the gun's inability to penetrate the heavy German armor and the poor armor protection given to the personnel by the half-track, this destroyer gave way to the high-velocity, flat-trajectory, three-inch gun on the M-10 motor carriage. In many respects, this vehicle was similar to the M-4 medium tank, except that it had an open turret and lighter armor. The gun was powerful enough to destroy the German PzKw IV tank, and the M-10 motor carriage offered the personnel protection from small-arms fire and shell fragments. As German armor was developed, tank destroyers had to keep pace in order to meet the newest threat.

In the spring of 1944, the M-18 made its appearance. The M-18 was a full-track, highly mobile, lightly armored vehicle, mounting a high-velocity 76mm gun. This was the first vehicle designed especially for the tank destroyers and is one of the finest track vehicles we have ever made. It was not long, however, before the German Panther and Tiger tanks appeared on the battlefield and it was found that the 76mm gun did not have the necessary power. The M-36 was created as the answer to these new German tanks. The M-36 is similar in appearance to the M-10, except that it mounted the 90mm antiaircraft gun.

Like matériel, the organization of the tank destroyers underwent considerable change in its early days. They were finally organized as battalions, groups, and brigades. The battalion was the tactical and administrative unit and was classified either as self-propelled or towed. The self-propelled battalion consisted of headquarters and headquarters company, a reconnaissance company, three gun companies, and a medical detachment. Each of the gun companies had three platoons of four self-propelled guns each, giving the battalion a total of thirty-six guns. The towed battalion was similar

to the self-propelled battalion in most respects, the main differences being that the guns were towed instead of self-propelled and the battalion reconnaissance consisted of only two platoons which were a part of headquarters company.

The group was a tactical organization only and consisted of group headquarters, a headquarters company, and two or more battalions. Normally, one group was attached to each corps. However, in combat, the group exercised very little command function over the battalions since the battalions were usually further attached to one of the divisions of the corps. The only time that the battalion I was with operated under a group directly, was when we were attached to VII Corps. In this case, the group had the mission of protecting the rear echelon of corps against possible parachute attack. The battalion was ordered to establish road blocks and maintain patrols in conjunction with other battalions. Generally, the group functioned as the tank destroyer section of the corps or in close cooperation with the tank destroyer section if such a section had been set up by the corps. In practice, the role of the group was to act as advisor on tank destroyer matters, as coordinator of tank destroyer employment, and as general supervisor of antitank defense.

### Primary Mission

The primary mission of the tank destroyers was the destruction of enemy armor. It was for this purpose that they were organized and trained. It was believed that the best way to accomplish this mission was to hold the battalion in division or corps reserve until an enemy armored attack appeared imminent. During the period that the battalion was held in reserve, it made a thorough reconnaissance of all likely avenues of approach and the selection of positions to repel any attack coming through these approaches. As soon as the direction of the attack was determined, the battalion would move to the previously selected positions and await the tanks. It was found that we could beat the Germans this way, but could not, because of our light armor, slug it out with them. Our motto was "Seek, Strike, and Destroy." The "Seek" was made by reconnaissance and intelligence—the "Strike" by hitting the enemy on the flank as he entered our position—and the "Destroy" by cutting him off by fire and delivering massed, close-range, direct fire on him.

However, by the time that we landed on the European continent, the Germans had suffered tremendous tank losses and their production of tanks was seriously hampered by the strategic bombers. The large-scale armored attacks of the Blitzkrieg had practically ceased. Instead, the usual tank formation seen consisted of from two to 10 tanks. In view of the reduction of the size of the attacking armored force, it was no longer necessary to employ the tank destroyer battalion in mass with its tremendous fire power. It was found that a company, or even a platoon, properly employed, had no difficulty in overcoming this new type of German tank attack. Therefore, it was generally decided that the tank destroyers should furnish close antitank support to the front-line units. Thus, the companies were attached to the regiment or the combat command, and, often, the platoons of the company were further attached to the battalions.

This, of course, made a considerable change in the employment of the tank destroyer battalion headquarters and the service elements. If the division did not have an antitank officer, the battalion commander functioned in this capacity under either the artillery commander or the G-3. Either he or one of his staff officers made frequent visits to the regimental and battalion headquarters not only to recommend but to supervise the employment of the tank destroyers. Very often, it was found to be most practicable to have a staff officer stay at the regimental command post. This officer would act in the dual capacity of liaison officer and commander. Whenever a trouble spot was encountered, the tank destroyer officer was right on the spot to recommend employment as well as to receive the orders. He would then radio the orders to the company or would have the company commander report to him so that he could give the company commander the situation and mission while the company was being moved up.

The job of the service elements of the battalion became more difficult. The companies, under this plan, were usually rather widely spread out. It was necessary, therefore, to plan and maintain two or three different routes of supply and evacuation. This, plus the fact that many supplies and services could be obtained only at army, kept the personnel of the service elements going morning, noon, and night.

When the tank destroyers were in direct support of the infantry, they had to be as close to the forward elements as the terrain would permit. In general, this meant that the tank destroyers would overwatch the infantry from positions 100 to 500 yards to the rear. A careful but rapid reconnaissance of the terrain was necessary to do this since the destroyers always attempted to get some defilade or cover, as well as good fields of fire. In the final analysis, the position chosen had to be one from which the tank destroyers could destroy the enemy tank before it could overrun our own infantry.

In order that the tank destroyers could intelligently cooperate with the infantry, close liaison was essential. Being the supporting arm, the plans of the tank destroyers were, of necessity, based on those of the infantry. It was, therefore, essential that the tank destroyer officer advised the infantry on the capabilities and limitations of the tank destroyers before the plans were made and the combat orders were issued. Further, the tank destroyer plans had to be tied into the antitank plan. In order to do this, the tank destroyer command post was usually immediately adjacent to that of the infantry and the tank destroyer commander became a member of the special staff of the infantry commander. Com-

munications, radio, telephone, and messenger, were constantly maintained between the two.

### Role of Assault Gun

The role of the assault gun naturally developed from this close front-line support. Toward the end of the war, this became the most commonplace mission of the tank destroyers. They were fairly well suited to this role because of their mobility and tremendous fire power, as well as armor protection. Here, the closest cooperation possible was necessary. We borrowed a sufficient number of SCR 300's from the infantry so as to be able to install one in each platoon leader's destroyer. We also put a EE-8 telephone on the outside of each destroyer for communications with the infantryman on the ground. Further, whenever resistance became sporadic, the infantry would ride on the backs of the destroyers, thus insuring even closer cooperation.

An example of this close cooperation and how the tank destroyers operated as assault guns was had by one platoon in the vicinity of Marienloh, Germany. One of the destroyers was brought under tank fire as the town was approached. The infantry immediately jumped off the destroyers and the destroyers hurriedly sought the best available firing positions. The tank, a Mark IV, was soon knocked out. The tank destroyer platoon then took the buildings in the vicinity of the tank under fire with HE ammunition. A considerable number of the enemy infantry were flushed out and were immediately killed or captured by the accompanying infantry.

When the tank destroyers supported an armored unit, they would be employed in much the same manner as when in support of an infantry unit. They formed the base of fire for the assaulting tanks and overwatched them to the objective. Often, in the assault on a town, the tank destroyers would swing around to the back of the town and take positions from which they could close the enemy's avenue of retreat by fire. Also, they were frequently employed as the flank guard for the armored division.

The tank destroyers were a welcomed attachment to cavalry units, primarily because of their fire power and punch. They were employed by the cavalry either in a close support role or to greatly increase the power of their reserve. When an important roadblock was established, you would usually find the tank destroyers there reinforcing the cavalry troops maintaining it. They were also used to quickly knock out any small stubborn resistance that would otherwise delay the advance of the cavalry.

The normal deployment of the division was to attack with two regiments abreast and one in reserve. This meant that the gun company attached to the reserve regiment was idle, that is as far as its fire power went. Also, it was not uncommon for the entire battalion, or a part of it, to be held in corps or division reserve, in which case a number of guns were silent.

Since a large proportion of the tank destroyer officers were field artillery officers, they began to think of the possibilities of using the battalion on indirect fire missions. This line of thinking was encouraged by most commanders since an idle gun is a wasted gun. The method of such employment was worked out with the assistance of the artillery. In the spring of 1944, indirect fire became another of the missions of the tank destroyers.

Originally, it was contemplated that a tank destroyer platoon would be attached to a field artillery battalion for operations. In practice, however, this did not work satisfactorily because of the differences in the guns and the fact that this would spread the battalion out over such a large area that it could not readily be assembled for its primary mission. In order to meet these objections, each gun company organized and trained a fire direction center, a survey crew, and a wire crew. The personnel for these various crews were taken mainly from the security section of the company and operated under the direction of the company executive officer. This meant that the company could be fired as a unit or that one platoon could be used in indirect fire at any one time. The targets were generally designated by the field artillery battalion to which the company was attached.

In a few cases, the battalion set up its own fire control center and operated directly under division artillery. During the halt, just prior to the crossing of the Rhine, such a plan was adopted and utilized by my battalion. We had a platoon from each of two companies in indirect fire positions during this period. The battalion S-2 and S-3 sections operated a fire control center. Here the targets were plotted as directed by division artillery and the fire missions were assigned to the companies. While this was mainly for practice and training, it was proven to the satisfaction of all that the battalion was capable of operating in this way.

### Roer River Crossing

"In the crossing of the Roer River, the tank destroyers were employed in indirect fire as well as direct fire. During the early hours of the assault crossing, fires were placed on enemy positions and installations across the river using indirect laying methods; in most cases, ranges were from 2,000 to 3,000 yards. Fires for the initial assault were scheduled. Targets selected were enemy assembly areas or avenues of approach which had been determined previously by infantry patrols, aerial photographs, air observation, reconnaissance company (Tank Destroyer) observation posts, and from G-2 information. Targets were plotted on the map by inspection and firing data computed; indirect fires were delivered during hours of darkness. As the infantry advanced up the escarpment, scheduled fires ceased and all fires were delivered on call from the infantry. Contact with the infantry was maintained by reconnaissance company personnel, equipped with radios, who

crossed with the leading infantry elements. During the assault crossing and the establishment of the bridgehead, tank destroyer guns were in indirect fire positions reinforcing division artillery fires in the corps sector. Targets selected were those suitable for harassing and interdiction fires, such as towns, roads, and road junctions. All fires were scheduled. Tank destroyer guns also fired illuminating shells according to a scheduled fire plan for the purpose of illuminating and directing the movement of the assaulting infantry."[1]

While the destructive effect of the tank destroyer shell was not as great as that of the 105, its harassing effect is believed to be greater since the high-velocity shell gives no warning of its approach. Also, the range of the tank destroyer was considerably greater than that of the 105—approximately 14,000 yards with both the three-inch gun and the 76mm gun, and 19,560 yards with the 90mm gun. This made it suitable for harassing fires, interdiction fires, and reinforcing fires. The tank destroyer gun was able to relieve the 105s of a number of their longer range missions so that they could be more effectively utilized in close support of the infantry.

Because of the absence of an armored, high-velocity weapon other than the tank destroyer, still another mission was given to the tank destroyers—the mission of destroying pillboxes and other fortifications. Since most of the forts encountered were found to be mutually supporting, the platoon was employed as the working unit. Two guns were placed in position to bring fire on the embrasures of the forts, while the other two were in an overwatching role. This prevented the Germans from manning their weapons while our infantry advanced the assault parties on the blind side of the fort to be knocked out. When the infantry were in their final assault positions, the infantry commander would lift the fire of the tank destroyers. This was usually done by radio but various other types of visual signals were used. The M-10, with its three-inch gun, proved to be an excellent weapon until the advent of the M-36, with its 90mm gun. The 90mm gun would penetrate three and one-eighth inches of concrete at 1,000 yards with one round. From three to 10 rounds were generally used to obtain a complete penetration. However, the maximum effort was made to secure firing positions from which the embrasure could be hit and it was not usual to attempt to penetrate the concrete of the fort.

When firing at the embrasure, it was often only necessary to get one hit. This would generally jam the shutters or would cause considerable flaking on the inside with consequent casualty effect. Whenever a penetration was made, a quick round of HE would bring the crew to its knees. One of the best-known operations of this type took place at Cherbourg. The infantry hit a particularly difficult fort which they were unable to approach because of the intense machine-gun fire from other forts which were so located that fire could not be brought on them. The tank destroyers were called up and immediately placed their fire on the steel door of the fort. The American commander then called on the Germans to surrender. The answer was that General von Schleiben, the defense area commander, Admiral Henneke, commanding naval forces in Fortress Cherbourg, their staffs, and about 800 other Germans capitulated. This was, virtually, the end of the defense of Cherbourg.

Our first mission, after leaving the staging area, was one that was unusual in the ETO but was commonplace in the Pacific. We were assigned the mission of protecting the southern coast of the Cotentin peninsula from possible attack by the Germans occupying the Jersey and Guernsey Islands. Contact was established with the CIC and the Navy. From these sources, we learned that the Germans were incapable of any large size attack. They had sufficient personnel but they had only a few small fishing smacks and possibly a few midget submarines. However, since it was believed that their food supplies were almost exhausted, it was very probable that they might stage several raids in order to get at the then vast dumps that were located on the Cotentin peninsula. After a thorough reconnaissance of the area was made, the sector was divided between two gun companies. The third gun company was held in reserve. The guns were emplaced on the commanding ground along the coast with each gun supported by at least one other. They were further tied together by patrols. It was also found that a British naval radar station was operating in our area and we established telephone communications with it. While we were on this mission, I heard my first newscast from Germany. The newscaster was saying that the German troops on the Jersey and Guernsey Islands were performing a very important mission in that they were keeping thousands of crack American troops tied up on the Cotentin Peninsula guarding the dumps.

There are probably many other missions that were performed by the tank destroyers; however, I believe the foregoing missions were the most important or at least the more commonplace. The tank destroyers were one of the most versatile units on the battlefield. They not only performed many varied missions but often found themselves performing two or three of them at the same time.

The tank destroyers have passed into history. However, recently one heavy tank battalion was made organic in both the infantry and armored divisions. At present this battalion is to consist of headquarters and headquarters company and three gun companies. Each of the gun companies will have four platoons equipped with M-26 tanks in each. I believe that these battalions were created to fill the job that was performed by the tank destroyers during the war. If this belief is correct, the officers in the new heavy tank battalion will do well to study the history of the tank destroyers thoroughly and profit by their experience.

[1]T D Information Letter No. 6 Hqs 1st T.D. Brigade.

# Sound Peacetime Pul

**The purpose of this article written by an experienced public information officer is to explain how public relations experience in wartime can be used to peacetime advantage.**

A SHARP decline of public interest in the Army and its activities takes place at the end of every war. The moment GI Joe returns home from the war and dons civilian clothes Mr. and Mrs. John Q. Public lose active interest in the nation's peacetime military establishment.

The problem facing Army public information officers today is to revive and maintain public interest in the Army and its activities by a sound and thorough public relations program.

Once a war ends the Army does not directly affect the lives and interests of the millions of persons that it did during wartime. The American press withdraws its hundreds of competent war correspondents. Only important news events in the Army are covered personally by the press in peacetime. Why? After all, it's the same Army although not so large.

In peacetime it is the public information officer's job to see that the American public is fully informed on military matters. He must be capable of creating and producing information that will interest editors of all media.

The job of being a public information officer *entails more than just producing a volume of press releases for home-town newspapers on individual soldiers.* He must be capable of supplying professional prepared copy for *all* mediums of information, such as: newspapers, magazines, radio stations, books, trade papers, house organs, etc.

It is the purpose of this article to explain how public relations experience in wartime can be used to peacetime advantage.

War correspondents in most every case during the war were assigned to units prior to their going into action. The period between time the correspondents joined a unit and the time it was scheduled to go into action was used by the public information officer and his staff for orienting the news writers and briefing them on the coming operation. The newsmen were furnished with a history of the unit and biographical sketches of the general officers and other commanders. These were always filed in advance by the correspondents.

Today when an event takes place at a military installation, either in the United States or overseas, the same procedure should be followed. The news writers should always be briefed in advance on what is scheduled to happen. They should have an opportunity to meet all the persons who will take a leading part in the event. A pre-event tour of the installation or area will also be in order. If possible, the public information officer should handle this tour and all the introductions on the way personally. But, at no time should he interfere with a newsman who is interviewing.

Advance stories were always written on the men and units to take part in a coming action. This too, should be done today. The public information staff should have prepared for all concerned a complete résumé of what is to take place and who will take part in it. When preparing the press releases don't forget to include the home-town address (both street and city) of each military person mentioned.

★Associate Editor of the ARMORED CAVALRY JOURNAL.

# ...lic Relations

by Major Hal D. Steward*

Adequate transportation was always available during the war to help each correspondent cover his story. The same should be true in peacetime. The public information officer must make certain at all times that sufficient transportation is at hand to accommodate all newsmen covering the event. There is nothing that irritates a newspaperman more than to be left without transportation to a spot where news is developing. This one thing is of utmost importance.

The speed with which news moves determines much of its value; therefore one of the public information officer's first considerations must be the establishment of a quick method for filing the correspondents' stories. The public information officer will do well to establish a messenger service that will function on a flawless time schedule, such as, one trip each half hour or one trip every hour on the hour, etc.

In wartime campaigns public information personnel were always assigned spots where news was most likely to pop. Newsmen couldn't be everywhere so it was up to the public information staff to cover what they missed. Then the public information stories would be handed out to the correspondents to give them complete and thorough coverage. It is the job of the public information staff to be as much help as possible to the correspondents. This is one way to help. The public information officer should make certain that no news event goes uncovered. The correspondents will appreciate this important service.

Regular and fruitful press conferences with military commanders pay off. The public information officer should make arrangements with his commander beforehand so that the commander will talk to the correspondents when they have queries of importance to ask. A regularly scheduled press conference that has been announced to all correspondents in advance usually works out the best.

A correspondent covering a story should also be provided with the necessary paper, carbons, typewriter and a place to write his story. The quartering and messing of newsmen must also be handled efficiently. They should never be required to perform any personal task that will interfere with their coverage of a news event.

It was discovered in World War II that press releases always got a better play if they were filed by the civilian correspondents. Therefore press releases should be handed out to the press representatives on hand rather than mailing the releases to individual newspapers and wire services. Of course, in the case of a press release for a weekly newspaper they should be mailed. But, no other exception.

To operate effectively, a public information officer must establish a working system; however, he must still plan moves ahead of time. When a big story is about to break, he must inform correspondents in advance, and arrange for the facilities they will need to cover it. And, to repeat, he must see that the stories are transmitted.

To illustrate, the commanding general of the First Cavalry Division received word on January 29, 1945, that the Division would move on Manila. This gave little time for arrangements, which were carried through as follows:

First, the war correspondents, who were at GHQ 60 miles away, were notified barely two days ahead of time that the Division would begin its race for Manila at midnight, January 31. Fourteen correspondents signified their desire to accompany the now famous "Flying Column."

The radio transmitter that would be used to send the stories out to the States was located at the GHQ public information office. It was necessary, therefore, to arrange for them to send a courier to the division's rear echelon, where he would pick up the stories that were sent back from the advanced echelon. En route, the division public information office operated in two separate sections. One of its jeep messengers, at one time, was traveling 75 miles to the rear echelon, and another the 60 miles from the rear echelon to the GHQ radio transmitter station.

On the way to Manila, the division commanding general held a press conference each night to keep correspondents informed on the military situation as it developed.

When the city was reached, a field artillery liaison plane was used to transport the radio correspondents and the written stories of correspondents to the transmitter at GHQ. The result was that news coverage on the First Cavalry Division beat that on other units by more than 24 hours.

The liberation of prisoners at the Santo Tomas University civilian internment camp drew practically all of the war correspondents in the theater, and to these the division public information officer was a host, whose duties included rationing and quartering them on the spot.

During this time the division public information personnel, which consisted of five men, were kept busy writing feature articles on the division and the men in it. Again the best feature stories were given the correspondents, and were invariably used.

News releases on every officer and man that entered

Manila with the "Flying Column" were sent immediately to home-town newspapers, and because they were timely, got a pretty fair play. To get them out fast, troop clerks were pressed into service.

In addition to caring for war correspondents and preparing hand-out releases, the public information section continually wrote stories about decorations and promotions. The stories behind the awards of the higher decorations were turned into general releases for the correspondents.

When publicizing any military unit, whether company or army, a public information officer must slant his material for possible use in all publishing media, and not concentrate his efforts on newspaper publicity alone. The other media are magazines, motion pictures, still photographs, radio networks and individual stations, and books. Magazines are on the lookout for feature stories about units which are built around one or two of its outstanding individuals; radio stations will use spot news, spot news features, and interviews with men who have done the unusual; motion picture and still cameramen always welcome any idea that will lead to good news or feature pictures; many war correspondents are writing books and will welcome material to include in them.

Public information officers should avoid "polishing the brass"; that is, spending a great deal of time writing about the high ranking officers in the unit. No story should be written unless it will stand up to a news or feature test. Only about 10 per cent of a unit is officers, and therefore about 90 per cent of the releases should be about enlisted men.

The public information officer should work directly under the Chief of Staff or Executive Officer as do other staff sections. This plan works best as it puts the public information officer on par with the other staff officers, which is a decided advantage.

There is no set of rules to follow in handling publicity for a unit, and a public information officer must make his policies as the various problems present themselves. For this reason a policy book should be formulated for the section as work progresses; from time to time it will be of great assistance.

If the Army public information officers will "play ball" with the newspapermen they will do the same with him. This writer has never, in years of Army public relations experience, known a newsman that wouldn't. Certainly, some are tougher to handle and please than others, but the successful handling of them attests to the public information officer's professional proficiency.

The reward to the Public Information Officer who does his job well is that self-satisfaction that comes from seeing that his unit gets public credit for what it does.


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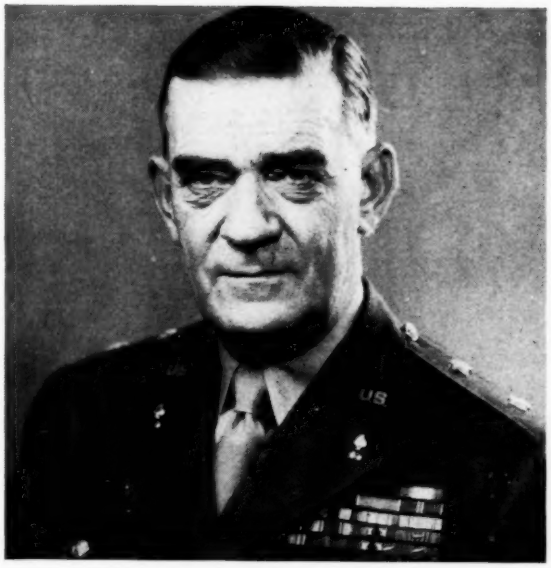

Major General Everett S. Hughes

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*(Editor's Note: The "Other Branches" section in the next issue of the* ARMORED CAVALRY JOURNAL *will feature a statement by Major General Spencer C. Akin, Chief Signal Officer of the Army, and a full-length article entitled "Significant Signal Corps Developments" by Gerald Egan.)*

**"Let me congratulate you on the inspiration that fathered your Other Branches Section. To my way of thinking, there is no question that it has great value as a forum where we all may meet to consider our mutual problems and cultivate a unity of thought and understanding. It gives us a chance to speak our minds.**

**"The thing on my mind now is the oft-repeated assertion that the advance of modern science in warfare has outmoded many traditional weapons.**

**"I don't agree at all. There has been change, it is true—a violent change; and there are doubtless more changes to come. But men and tanks and guns will still be needed in the next war. The tanks and guns will probably be quite different from those we used in World War II. More of them will be transported by air but, at their destinations, they will deploy and fight much as they always have.**

**"On this subject, as with so many others, too many people are too ready to make predictions supported by scant experience. Actually, as the history of gunpowder shows, revolutions in warfare are usually relatively slow evolutions. It is up to us, therefore, to keep our own counsel and continue to work out our long-range problems."**

**Major General, U. S. Army,**
**Chief of Ordnance.**

ORDNANCE DEPARTMENT

# Postwar Ordnance Problems Of Storage And Maintenance

*by Brigadier General J. Kirk**

**Between the Armored Cavalry and the Ordnance Department there is a closer bond, perhaps, than exists between any other segments of the Army and Ordnance. The Armored Cavalry is Ordnance's best "customer" from the standpoint of tonnage of such primary matériel as tanks and guns. Ordnance designs, procures, stores, supplies, and maintains the matériel with which the Armored Cavalry fights and moves.**

IN peacetime, the great "corporation" that is the Ordnance Department finds itself confronted with a monumental task of storage and preservation of matériel. Having designed and perfected both great fire power and high mobility to meet its "customer" demands, and having incorporated these characteristics in items produced in quantities for which there is no longer a large immediate need, Ordnance must store and then issue matériel in a direct proportion to the requirements of the using arms. Within the Department, Field Service performs this task.

Between the Armored Cavalry and the Ordnance Department there is a closer bond, perhaps, than exists between any other segments of the Army and Ordnance. The Armored Cavalry is Ordnance's best "customer" from the standpoint of tonnage of such primary matériel as tanks and guns.

Ordnance designs, procures, stores, supplies, and maintains the matériel with which the Armored Cavalry fights and moves. These "corporation jobs" are carried out at the behest of the using arm, with Ordnance coming up with ideas for perfection across the board.

To understand the magnitude of the postwar Ordnance problem, it is well to examine a few wartime figures.

During the war, Ordnance became the greatest single "industrial corporation" ever conceived. Ordnance expenditures for matériel ran close to 38 billions of dollars, or more than 50 per cent greater than the entire American national debt following World War I. Ordnance procurement in the urgent years of World War II was actually higher, in dollar value, than for all other War Department technical services combined. Included in this procurement were about 85,000 tanks; 600,000

*Chief of Field Service Division, Ordnance Department.

artillery pieces; 12,000,000 rifles and carbines—five times the number of rifles made for our army in World War I; and 18,000,000 tons of ammunition.

Mountains of Ordnance matériel were expended during the fighting. At the war's peak, for example, one month's expenditure of small-arms ammunition was 293,000,000 rounds. Artillery ammunition was supplied to the guns at the rate of one ton of shells per gun per day to support such barrages as that of the Third Army's XX Corps before Metz. During that 10-day assault, the Corps threw at the enemy 1,000 tons of projectiles.

Our Air Forces dropped over Western Europe 1,500,000 tons of bombs, while the British dropped another 1,000,000 tons of American-made bombs. In addition to battle losses, considerable quantities of ordnance matériel were expended through ordinary wear, weather, accidents, and the like.

When the war was over, however, the task ahead of Ordnance's Field Service was complicated by a number of things.

In the first place, depots were full to overflowing with peak-of-production matériel. This was particularly true in the case of artillery ammunition, for an accelerated rate of production had been instituted a few months before Germany capitulated, at the time of the Battle of the Bulge. In the spring of 1945, ammunition of all types was being produced at the phenomenal rate of 700,000 tons per month, which figures out at an annual rate of more than 8,000,000 tons!

The turn-around of loaded ships after VE-Day was a second factor. In those latter days of the war in Europe, the Atlantic was more crowded with ordnance-laden ships than ever before. Most of these vessels were turned back so the matériel, and particularly the ammunition, could be re-routed to the Pacific. In many cases, circumstances dictated that cargoes be unloaded on the east coast and shipped by rail to the west. Depot and rail-shipping problems were further complicated by this expedient.

After VJ-Day came double aggravation of the storage task. For a considerable time, matériel continued to flow from production lines to the depots until all contracts could be cut back. At the same time, quantities began returning from overseas. Both the Atlantic and the Pacific areas contributed, primarily in ammunition. It, therefore, became necessary for the Ordnance Department to arrange for the reception and storage of quantities excess to the needs of the armies of occupation. There was the exception that much noncombat matériel such as motor transport vehicles and parts could be declared surplus at its overseas location.

### Speed Vital In Planning

Speed in planning was vital, for ships had to be freed for other purposes, and returned ammunition was arriving in huge tonnages. In June, 1945, there were just over 4,000,000 tons in United States depots. By October, the total had risen to more than 5,250,000 tons, the increase representing final receipts from ammunition plants plus shipments diverted to this country. Additional tonnages continued to arrive so that by February, 1947, the total ammunition, including bulk explosives and components, stored in United States depots, arsenals, and plants was more than 8,000,000 tons.

This amount is greater than the quantities on hand in Zone of Interior at any time during the war! And it remains higher despite demilitarization of obsolete and deteriorated ammunition for the salvage value of the metals.

General supplies constituted the bulk of the matériel other than ammunition which came home. As early as 1943, the need was seen for reconditioning much of this matériel and returning it to useful service. Yet the inflow of returning Ordnance parts, tools, accessories, and other supplies was so great that its storage would have impeded the outflow of new production through Ordnance depots. Therefore, the Department established four returned matériel centers. These were devoted solely to the segregation, identification, repair, and return to stock of supplies pouring in from home installations and overseas.

Greatly accelerated returns were noted immediately after VE-Day. Thus the handling capacity of these centers was taxed to the extent that matériel had to be diverted into other Ordnance depots.

That the load was heavy is indicated by the fact that between January 1945 and December 1946, tools, accessories, and supplies received from Zone of Interior establishments totaled almost 500,000 tons. At the same time, overseas theaters contributed about a third of a million tons. Add such major items as vehicles and artillery, but excluding ammunition, and the total returned in the period from the middle of 1945 to the end of 1946 was just over 2,500,000 tons.

Here was an enormous augmentation to Field Service's handling, storage, and maintenance task. Fortunately, however, it has been possible to declare some of this matériel surplus, while some, badly damaged in use or otherwise in poor condition and no longer fit for economical reconditioning or repair and return to stock, has been salvaged for metal values.

A further difficulty that early forecasts indicated would plague the Ordnance Department was the decrease in number of depots that would inevitably come with the cessation of hostilities. Just before that time, there were 46 Ordnance depots. In addition there were a number of Ordnance sections of General depots. By January 1947 many depots had been made subdepots and some had been placed in a "caretaker" status due to decrease in funds and personnel.

The size of the job done by Ordnance for the war effort, the quantities of matériel on hand at the end of the war, the storage space available, and the future plans of the using arms all combine to determine Ord-

nance's storage and issue task. Specifically, Ordnance will store and issue on demand during peacetime the types and quantities of matériel required now and in the future by the Armored Cavalry.

The Regular Army has, in peacetime, about a million men, many of whom are overseas in the Pacific and Europe, while others are in training areas in the Zone of Interior. The National Guard and other civilian components must be taken care of. All have to be supplied with Ordnance matériel for training and replacement. Accordingly, they must have large numbers of vehicles and large quantities of ammunition.

Here, then, is Ordnance's biggest current task. Vehicles are bulky and susceptible to deterioration because vital parts are not easily covered with protective materials. Ammunition is comparatively bulky and is extremely dangerous. Both can best be stored under cover, but extensive covered storage is not possible. There aren't enough sheds, much less warehouses and magazines to meet the needs.

That is why one may see, in depots scattered throughout the country, hundreds of vehicles lined up hub to hub in open storage. This is why, also, large acreages are studded with ammunition magazines of several types, and more acres are devoted to outdoor storage of bombs and shells behind barricades and widely dispersed. The general supplies, the tools and spare parts and small-arms ammunition take up much of the space in depot warehouses. Some artillery is in hard standing storage, while some is in warehouses, and an appreciable quantity, together with fire control instruments, has been "canned" for storing indoors or out. In addition, large numbers of combat vehicles have been placed for long-term storage in converted oil tanks, so that the sites of their storage look like the storage fields of oil refineries.

Both vehicles and such heavy ammunition as projectiles and bombs require special preparation for outdoor storage, plus continual surveillance thereafter. The house must be kept in order if the things that are being preserved are to be in condition for issue when needed.

### Outdoor Storage Preparations

Preparation of vehicles for outdoor storage necessitates, first: Inspection for serviceability in accordance with definite standards. Those found serviceable are processed in accordance with prescribed methods. If unserviceable, but economically repairable, they are repaired and made ready for issue complete in every detail, or stored "as is" for future repair work when space and facilities permit.

The processing of vehicles for standby storage includes but is not limited to such details as blocking all wheels free of the hard standing; spraying the inside and outside of all engines and vital parts of transmissions, transfer cases, differentials, front axle bell joints, and machined surfaces such as universal slip joints with rust preventives and/or corrosion preventives. Sealing of engine compartments to prevent dirt and moisture from accumulating and the blocking of the truck bodies to provide natural drainage. The instrument panel and all electrical connections must also be sprayed with ignition insulating compound to prevent corrosion.

Each individual task must be accomplished in addition to protecting the radiators and engine blocks from freezing or rusting, caring for storage batteries and tires, and removing rust spots—a continuous program. This is a gigantic operation since the number of vehicles to be handled totals over 200,000 for which little, if any, covered storage is available.

Whether stored outdoors in sheds or barricaded open sites, or indoors in standard magazines or igloos, ammunition poses a number of problems. Because the quantitites to be preserved to meet current demands and as peacetime operating reserves are far greater than ever before in our history, methods of storing in magazines have had to be revamped. More compact stacking; disassembly and separate storage of fins, grommets, shipping bands and other awkward appendages; and limitations of, or actual discontinuation of, lateral aisles in magazines of all types, are some of the measures that have been resorted to for most efficient utilization of available space.

In magazines, sheds, or barricaded open sites, ammunition must be under constant surveillance. This consists of the observation, inspection, test, study, and classification of ammunition and its components, and of explosives with respect to their serviceability, hazard, and rate of deterioration; the inspection of facilities and methods used in handling, storing, shipping, maintaining, reconditioning, renovating, salvaging, and destroying ammunition; the inspection of containers and buildings; and the preparation and maintenance of all records, reports, and technical data.

If the comprehensive nature of this work that must be carried on constantly by Ordnance's Field Service is not immediately apparent to the layman from the foregoing, here is a further impressive fact: There are now 450 ammunition inspectors in the Ordnance Department and about 70 overseas. Their work is extremely important on a continuing basis, for while our explosives and powders are relatively very stable compounds, they are subject to imperfections that lead to accelerated deterioration. Ammunition that has deteriorated from any cause may become hazardous. If it is found that unsafe conditions are developing, the particular type or quantity of ammunition affected is renovated or destroyed. It is the inspector who makes the determination in such cases, but a sizable army of expert workers is necessary to do the job he orders.

The ammunition inspector is a definite and important link in the chain of operations performed by the Ordnance Department for the using arms. He is but one keyman of the many in Ordnance who keep the house in order.

ARMY AIR FORCES

# AAF Postwar Research Program

*by James A. Niland*

THE Army Air Forces came out of the second World War as the greatest air force in history. The greatness of the AAF was not so much the numerical superiority of men and planes, but was directly attributable to the technical and scientific genius of the men who built and flew the planes.

To maintain that aeronautical acumen, the AAF last September opened the Air Institute of Technology at Wright Field. From this school in the years to come, will issue a steady stream of highly trained AAF officer-experts in aeronautical engineering and logistics.

The Institute, as such, is new, but the idea dates back to 1919 when the Air School of Application was established at McCook Field, the forerunner of Wright Field. Within a year after its opening, the name of the school was changed to the Air Service Engineering School. Under this title and through the years antedating World War II it trained hundreds of Air Corps officers, both Regular and Reserve. During the interim of peace the Air Corps was limited by appropriations, but the training received by these men enabled them to put theory into practice when war came. Cogent proof of their training was demonstrated by the fact that the majority of the combat planes used by the AAF in the European theater prior to V-E day had been planned by the AAF before December 7, 1941.

The 1946 class of the Institute had 190 officers enrolled, most of them in the two-year course and about 50 in a one-year course of higher level. Graduates, for the time being, are awarded certificates of accomplishment. Later, if the Institute is accredited by appropriate academic associations, bona fide degrees will be awarded.

The Institute is composed of two colleges, engineering and logistics. The College of Logistics covers the business end of the AAF program which is responsible for the procurement, production and inspection of all AAF planes and equipment. It isn't an easy matter to buy an airplane, not quite as easy as buying a motor car. Planes are intricate machines composed of thousands of component parts. Few aircraft manufacturers build more than the airframe or the engine. Instruments, wiring systems, radio equipment, etc., are purchased from sub-contractors. Although the AAF contracts with a plane manufacturer for a complete and flyable plane, Air Force procurement officers supervise the manufacture of and inspect every component part made by sub-contractors.

The curriculum of the Engineering College includes the principles of plane construction and the research and technical developments of air equipment. What the student of this school learns to build and create, the students of the Logistics College manufacture and buy from American industry.

The professors at the Institute are civilians whose salaries are commensurate with those paid to teachers in civilian colleges and universities. The assistant professors and instructors are the main civilians, but there are a small number of military men on the faculty by reason of their exceptional talents.

The faculty members and personnel policies were determined by an Advisory Council. Dr. John R. Markah, Associate Professor of Aeronautical Engineering at the Massachusetts Institute of Technology, heads the council, which includes Dr. W. H. Pickering and Dr. Theodore H. Troller, of the Case School of Applied Science.

Although the precedent for a school of this type has been established, the Commanding General of the Army Air Forces, General Carl Spaatz, directed that the group of civilian scientists survey existing civilian educational facilities to determine whether or not the same courses of study could be taught in American colleges and universities.

The civilian scientists after a comprehensive and careful survey reported, "There are no means available at the present time or in the immediate future for obtaining the desired undergraduate education in any of the existing civilian institutions. The discrepancy between the requirements for the basic technological education of AAF officers and that undertaken by civilian institutions is caused by three points: (1) difference in maturity and previous training of the prospective students; (2) specific combinations in educational subjects which are necessary due to the broad fields which must be converted in general institutional training; and (3) education in the civilian school would involve a longer period in schools to permit covering the specialized need of AAF officers."

Entrance requirements for prospective students are rigid. Only Regular Army officers or those who have agreed to remain with the AAF for four years after graduation are eligible. And of these, only men with "excellent" military efficiency rating are acceptable. Scholastically, an applicant must have completed at least two, preferably three, years of college work towards a B.S. degree. The entrance requirements are rigid because the AAF wants to train its best men, capable of assuming responsible assignments in the peacetime program of research and development. Moreover,

the scholastic level of the Institute is comparable to third and fourth year college work, with some engineering courses of graduate level.

Few educational plants can point to the elaborate laboratories and research facilities available to Institute students at Wright Field. The Army Air Forces is teaching theory in the midst of application.

Supersonic flight is probably the most spectacular part of the program and one that is of inestimable value to commercial aviation as well as military. The AAF's first supersonic plane, the XS-1 was first flown in December of 1946 and since that time has completed 20 powered flights. This marks the end of the primary test program and opens the way for further research by the AAF and the National Advisory Council of Aeronautics with rocket ships.

During 1947, the AAF had added four bombers to its postwar air fleet. One, the Boeing B-50, is a new and improved version of the B-29, the other three are jet bombers.

First of the jet bombers to be delivered was the North American B-45, a four jet bomber. By standards of World War II, the B-45 compares in size to a heavy bomber, it is classified, however, as a medium bomber. It is patterned along conventional lines, although it is highly streamlined, and is as sleek as a modern fighter plane. Because of the extreme high speed performance of the B-45, the heat generated in the cabin by the friction of the plane against the air would make the crew members uncomfortable at low altitudes without a cooling system. For low altitude operations a refrigeration unit has been installed which will produce temperatures 30 degrees below outside temperatures.

The Glenn L. Martin Company produced for the AAF its first six jet bomber the XB-48 in fourteen months, a full year less the normal time required to build a new military airplane. The XB-48 spans 108 feet, 4 inches across the wing, has an over-all length of 85 feet, 9 inches and is 27 feet, 6 inches high.

Jet power, however, is not the exclusive province of the fixed wing aircraft. AAF engineers in cooperation with the engineering staffs of General Electric, McDonnel Aircraft Corporation, Autogiro Corporation of America and others are experimenting with jet power for helicopters. Ram jets, reso jets and turbo jets may one day replace the reciprocating engines now used in helicopters. Helicopter development is an important item on the AAF's research and development program which includes development of liaison type helicopters for the Army Air Forces and Ground Forces and medium and heavy helicopters for cargo and rescue work.

Of the many developments of the research program for comfort and safety of AAF personnel, the Pulsating Seat and Lumbar Pad is one of the most unique. It was designed by the Personnel Equipment Laboratory at Wright Field to prevent discomfort of pilots who are confined to a sitting position during long flights and will prevent compression fatigue induced when a person sits for a considerable period of time without change of position. The pulsating seat is designed to alleviate this condition by massaging, while in flight, those parts of the body which are susceptible to compression fatigue. The inventor of the pulsating seat is Dr. D. V. Summerville, a bomber and fighter pilot of World War II.

Another safety development of Air Matériel Command is a flying suit with built-in inflation bladders located in such a manner to make it impossible for the wearer to lie on his face in the water. The suit was designed for use by personnel flying over water and has been constructed to incorporate the functions of three garments, the light flying suit, the life vest and emergency sustenance vest or kit. Combining the three suits into one reduces the over-all weight of flying clothing by about two pounds. The suit is made from a closely woven cotton twill. Its life vest action is obtained from a circular neck bladder and a rectangular chest bladder made from lightweight neophrene coated nylon. It can be inflated either orally or by a carbon dioxide cylinder located at the base of the chest bladder. From tests conducted in the Personnel Equipment Laboratory at Wright Field it was found that the suit rights itself in less than three seconds after hitting the water.

An additional safeguard for personnel flying over water is about 104 men rescue raft known as "The Wheel." It was designed especially for the AAF's air-sea rescue program to be used in the event of disaster, such as shipwreck, where temporary means of survival are essential. The raft consists of a main circular tube looking very much like a doughnut, with two cross tubes.

The high speed of jet planes posed a safety problem that would allow the pilots to escape from a disabled plane without being crushed against the tail of the aircraft, by the terrific rush of air. The solution came with the development of the Pilot Ejection Seat. By squeezing a trigger the pilot sets in operation a series of automatic events. First, the Ejection Seat is actuated, shooting him straight up at a speed of approximately 60 feet per second. Three seconds after leaving the plane, an automatic small explosion takes place releasing him from the seat in mid-air. After his release, he is permitted to free fall for another three seconds before the last automatic action takes place which opens his parachute.

Two years after the end of the second World War, the AAF consists of 300,000 men and 25,000 planes, 5,000 planes less than were procured during the last year of the war. During 1946 a total of 1,010 military aircraft were delivered to the AAF, a sharp contrast to the 70,000 delivered during 1944. A vigilant peacetime military establishment-industrial preparedness demands that the AAF be kept continuously provided with sufficient quantities of planes and equipment to permit defense maneuvers on a reasonably large scale.

# Individual Tank-Infantry Communications

*by Captain James J. Butler**

TACTICAL OPERATIONS during World War II clearly demonstrated that the most effective ground force team was one composed of tanks and infantry operating in close coordination. Certain very special operations may not permit the employment of tanks but, generally speaking, a closely coordinated tank-infantry team, supported by artillery, met with much greater success than either tanks or infantry operating alone. Each component of the team is capable of overcoming certain inherent weaknesses of the other component, thus increasing the effectiveness of the team as a whole.

The term "individual tank-infantry team" as used in this article is not intended to imply that one tank and a squad or platoon of infantry are operating alone. The purpose is to consider the communication problems of the smallest tank-infantry unit which actually forms part of a larger unit.

The key to securing close coordination within the tank-infantry team is an adequate communication system. The dismounted infantry must be able to communicate quickly with the tank in order to secure the support of the tank weapons in reducing enemy machine guns and foot troops which may hold up the advance of the infantry. Likewise, the tank must have good means of communication with the infantry in order to secure their support in reducing antitank guns, bazooka teams and other enemy installations which are a threat to the tank. In other words, the effectiveness of the tank-infantry team is dependent upon adequate and continuous communication between the two components of the team.

The means of communication available to the tank-infantry team are: 1—radio; 2—wire; 3—visual signals; 4—messenger or liaison; 5—sound signals; and 6—external tank interphone. We shall consider each of these means in detail and take into account their advantages and disadvantages. This article will deal mainly with the two primary methods of tank-infantry communication: the external tank interphone and the radio.

Communication between headquarters of units of company or larger size does not present a major problem and is not considered here. It must be borne in mind that the communication problems considered here are primarily those encountered by the individual tank and the small infantry unit operating directly with this tank.

A basic principle of combat communications is that more than one means must be available in order that a channel will still exist even though the primary method has failed. A good communication system must also be simple and flexible. The need for an elaborate system can be eliminated, to a large extent, by joint training of the units and detailed planning on the part of both commanders. Adequate means of communication must be provided in any event because combat conditions frequently prevent joint training of the units prior to their joint employment.

We shall first consider radio as one of the means available to the team. A tank platoon is authorized the following radios: one SCR-508 in the platoon leader's tank; one SCR-528 in each of the other four tanks; one each AN/VRC-3 in the platoon leader's and platoon sergeant's tanks. Note that three tanks in each platoon are not equipped with an AN/VRC-3 radio. The armored infantry rifle company is authorized one SCR-300 in company headquarters; six SCR-510; six SCR-536; and one SCR-508. The rifle company in an infantry division is authorized one SCR-300 and seven SCR-536 radios. The SCR-300 and the AN/VRC-3 radios are basically the same. They differ only in that the SCR-300 is a portable set and the AN/VRC-3 is designed to be mounted in a tank.

Now let us consider the possibility of netting the radios in the armored infantry company with those in the tank company. The armored infantry will normally be dismounted during operations, and therefore, their SCR-508 and SCR-510 sets will not be available for direct communication between the infantry on foot and the tanks. The SCR-510 can be converted to the SCR-509 which is a portable set. However, the SCR-509 is too cumbersome to serve as a practical portable radio for infantry troops. The SCR-536 sets carried by the infantry will not net with any of the tank radios. This leaves one SCR-300 in the infantry company headquarters to net with the seven AN/VRC-3 radios in the tank company.

### Relay System

One method of securing radio communication is through a system of relays. A message originating in

*Student, The Armored School.

the infantry platoon may be sent to the infantry company headquarters by means of the SCR-536 sets. At company headquarters the SCR-300 may be used to relay the message to one of the tanks which is equipped with an AN/VRC-3. In the case of an armored infantry company in which a SCR-510 is available at company headquarters, this set may be used to relay the message to any tank in the platoon. Any relay system is slow and cumbersome though, and is likely to result in delay or error in transmission.

Thus it is noted that with the radio sets which are authorized to the tank company and the infantry company—either armored infantry or regular infantry—direct radio communication between the individual tank and the small infantry unit do not exist. During the recent war, many units tried various ways of augmenting the authorized tank and infantry radios in an effort to improve radio communication. One method was to issue SCR-536 sets to the tanks. This gave the individual tank a radio which would permit direct communication with the infantry platoon. However reports from both the European Theater and the Pacific Theater indicated that the SCR-536 did not give completely satisfactory results when operated from a tank. The range of the SCR-536 is very limited and it was found necessary to operate the set either on the outside of the tank or with the antenna projecting through an open tank hatch. A more satisfactory solution was to equip the infantry with a SCR-300 in each platoon and to install an AN/VRC-3 in each tank. It was found that without SCR-300 communication between tanks and infantry, the cooperation of the two units was materially impaired.

Another important means of communication available to the team is an external telephone handset mounted in a steel box attached to the rear of the tank. The handset is connected with the tank interphone system. This system was developed through a series of field expedients. An improvised telephone system was first used which permitted the infantryman to talk with a member of the tank crew. A telephone inside of the tank was connected to a length of field wire which extended fifteen or twenty feet behind the tank. An infantryman carrying a field telephone could connect it to the wire and communicate with the tank crew.

The weakness of this system is apparent. The wire trailing behind the tank would become entangled in the tank track or around some other object and would be ripped loose. The next step in the development was the installation of an interphone box mounted in an improvised metal box on the rear of the tank and connected into the interphone system. With a handset connected to the interphone box, the infantryman could lie alongside or under the tank and talk with the tank crew. This system functioned well in dry weather but in damp weather, moisture would get into the interphone box and ground out the entire interphone system. The final development was the installation of an external interphone in a moistureproof metal box on the rear of the tank. A signal light on the outside of the tank is used to indicate that the tank crew desires to communicate with the infantry.

The chief advantage of this system is that it provides a positive and direct means of communication. Its main disadvantage is that the infantryman may be reluctant to expose himself during an artillery barrage, and at times, the tanker may have difficulty in getting a response to his light signal. This illustrates the necessity for having more than one means of communication available. However, the external tank interphone has proved a reliable system.

Some units in the European Theater were of the opinion that tank-infantry radio communication need not extend below the infantry company. In their opinion, the external tank interphone was satisfactory as the primary means of communication between infantry units smaller than a company and the individual tank. The external interphone is an excellent system of communication between the individual tank and the small infantry unit. However, as mentioned previously, at times when the tank is under artillery fire, it may not be a continuous means. Therefore, radio should be available as a parallel channel.

### Use of Wire

Wire is a means which can be used in some very unusual situations. As the role of the tank in combat requires that it be mobile, wire will be used very infrequently. In certain defensive situations where it is expected that the tank will remain in position for a considerable length of time, telephones may be installed. However, wire must be considered to be only a secondary means of communication as it will be disrupted as soon as the tank is moved. The tank-infantry team is normally moving while it is fighting, thus the use of wire is not practical.

Visual signals and sound signals offer another means of tank-infantry communication. Visual signals consist of the use of arm and hand signals, pyrotechnics, tracer ammunition, and lights. Sound signals can be used to convey certain prearranged messages by tapping on the hull of the tank. Both visual and sound signals are supplemental means of communication and must be augmented by other systems such as the external interphone or the radio. These methods also require prior joint training of the team. They are excellent for conveying short, prearranged messages. However, to be of practical value, the members of the team must be thoroughly familiar with the meaning of all prearranged signals. The principal use of smoke and tracer ammunition is the designation of a target which one member of the team has located and wants the other member to take under fire. The effectiveness of visual and sound signals will depend entirely upon the joint training or previous joint combat experience which the team has had and the coordination and detailed planning by both

commanders.

The use of messengers or command liaison is necessary at times. In teams as small as the individual tank and a small unit of infantry, it is frequently necessary for the commanders to establish personal contact, either by the tank commander dismounting or the infantry commander climbing up on the tank. Messenger and liaison may also be considered as a means of communication available to the team.

To summarize, the primary means of communication available to the individual tank and the small unit of infantry operating with it is the external tank interphone. The supplemental means are: visual signals; sound signals; and liaison. Radio is the primary means of communication between the tank section or larger tank unit operating with an infantry unit. Considering the radio equipment which is authorized to the tank platoon and the infantry platoon—either armored infantry or regular infantry—it is evident that radio communication between the individual tank and a platoon or smaller unit of infantry is not possible unless a relay system is used. Radio sets should be designed which would provide satisfactory communication between the individual tank and an infantry unit of platoon or smaller size.

The preceding considerations bring us to certain conclusions. Even though the infantry is authorized radio equipment down through the platoon, direct radio communication between the infantry platoon and the individual tank is not possible because the radios with which the two units are equipped are of different types and will not net. There is need for redesigning the radio equipment used by the various arms. The ground forces need a common type of radio which will combine the best features of the SCR-300, SCR-536, and SCR-508. It is realized that different types of radios are used by different units in order to avoid interference caused by too much radio traffic on a common channel. This objection could be eliminated to a large extent by extending the frequency range of a radio such as the SCR-508.

A frequency modulated radio similar to the SCR-536 in size, weight, and range would be an ideal set for the small infantry unit. Such a radio would require only two or three channels and could net with the primary radio in the tank. In this case only one radio would be needed in the tank. A radio in which the range is limited to approximately one mile would cause very little interference with adjacent units. Since it needs only a limited number of channels and could be made compact and lightweight, it would be especially suitable for use by dismounted infantry. Such a set would provide the small infantry unit direct communication with the tank with which it is operating. A radio of this design would eliminate the difficulties which exist now as the result of the use of a system of relays and, to a large extent, would forego the necessity of establishing physical contact between the commanders.


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# Battlefield Vehicle Recovery

*by Captain Arthur R. Rolph**

**Battlefield recovery of vehicles enabled the tank elements of the 1st Armored Division to maintain their vehicular strength as close to maximum as possible. Captain Rolph, a former 1st Armored Division officer, discusses in this article the battlefield vehicle recovery methods used.**

BATTLEFIELD RECOVERY is a phrase with which all armored officers are familiar in a general way. Most officers, however, think of it as removal of disabled vehicles from a scene of action after the action has moved forward. As used in this article it means the recovery of any vehicle from an area which is under fire at the time of recovery, or which is in front of our foremost friendly troops. This is what Battlefield Recovery meant to the 1st Armored Division in a large phase of its operations during World War II.

Recovery of vehicles from such areas enabled the tank elements of the 1st Armored Division to maintain their vehicular strength as close to maximum as possible. It was at times of utmost value and it is very possible that again, in a future war, armored units may have the need of recovering vehicles from the field of battle with the maximum speed by taking certain risks, which, under more favorable circumstances, would not be considered.

Only under special conditions is it of value, or necessary, to recover a disabled vehicle in an area forward of friendly troops, or in an area which is under small-arms or artillery fire. One of the biggest factors in making a decision relative to the recovery of vehicles is the supply situation. When the supply of replacement vehicles is extremely scarce, or nonexistent at the time, certainly recovery of lost vehicles will be considered. Another equally important factor to be considered is the rate of advance. A slow rate of advance, or no advance at all, coupled with a dismal supply picture are the most conducive factors leading to a decision to expend great efforts to recover disabled vehicles as rapidly as possible despite adverse conditions.

In order to fully see why vehicular recovery on the battlefield as performed in the 1st Armored Division was different from most other armored units in World War II, and to appreciate why it was done, as it was, it is necessary to examine some pertinent facts regarding the Division, beginning in July 1940, the birthday of the Division.

From 1940 through the 1941 Louisiana maneuvers the tank regiments' organic maintenance support consisted of a maintenance platoon which was a part of the Regimental Service Company. This platoon had one 10-ton wrecker which was the only recovery vehicle in the regiment. The maintenance platoon had a crew assigned to support each battalion and their vehicles consisted of one half-track and one ¼-ton truck which was the same as the maintenance section of each company. Throughout this long period comparatively little thought was given to battlefield recovery methods as they would be performed in combat. It is true that prior to the Louisiana maneuvers, and during them, reports trickled in from Africa on British and German experiences in their desert combat. Some good was derived from these experiences as they applied to battlefield recovery, but unfortunately probably not the maximum. In comprehending what was to be faced, and how problems were to be solved when they were met in combat, it was almost completely a case of the blind leading the blind.

Lessons were learned, and progress was made, despite groping and fumbling in the dark. Shortly after maneuvers in early 1942 the Division was reorganized, and among the changes were improvements in the maintenance picture. It was quickly discovered, by the problems which arose during maneuvers, that one 10-ton wrecker per tank regiment was inadequate, to say the least. Machine Gun Company plus elements of the Service Company were combined to form a Maintenance Company in each tank regiment. The Maintenance Company now had four 10-ton wreckers.

The two tank regiments had no material changes in their organizations as applied to maintenance from

*Student, The Armored School.

January 1942 until the spring of 1943. In Ireland when the regiments were forced to bivouac their battalions in separated areas, the maintenance crews, which were dispatched from the regimental maintenance company to support the battalions, physically joined these battalions and lived with them, fortified by one 10-ton wrecker each. It was not until the war in Africa had ended that the first real tank recovery vehicle was received, the T-2, a modified M-3 medium tank.

Along with prior training, equipment, and many obscure factors which would be difficult to enumerate, or evaluate, it is necessary to consider that time honored army phrase, Standard Operating Procedure, as it affected battlefield recovery in the Division. Settling on a completely workable SOP was, like so many other things in all phases of the development of the Division, a question of many trials and many errors. By the time the tank regiments went into combat in Africa in November 1942 they had arrived at an SOP for battlefield recovery which, in its basic principles, worked surprisingly well throughout Africa and required only those adjustments which one must expect on the part of, not only Standard Operating Procedures, but equipment and personnel, when exposed to the supreme test of combat.

This is the SOP used from November 1942 to July 1944. The responsibility for recovering vehicles from the battlefield was from the lower units to the higher. The using company that lost a tank was to initiate steps to recover the tank, and if it failed to make recovery it was to report the location and condition of the vehicle to its supporting battalion maintenance crew. The battalion crew in turn had the same responsibility as the company, and if they failed to make recovery, reported to the regimental maintenance company. The same responsibility fell upon the maintenance company, who, in case of failure, sought the assistance of the supporting maintenance company from the Division Ordnance Battalion. Because it was far better fitted from the standpoint of equipment and personnel than either the companies or battalions, the bulk of the recovery work was performed by the regimental maintenance company. The supporting divisional maintenance company was called on very seldom to perform battlefield recovery. It was used primarily to evacuate vehicles from collecting points to which they had been towed by regimental maintenance or to clear vehicles from the battle area a considerable time after the action had moved forward.

Of all the battlefield recovery which took place no two occasions were exactly alike. As in tactics, broad principles did not change, but the application of principles to a great variety of situations differed with each one. To illustrate this, several examples of typical battlefield recovery operations will be considered.

On one occasion five tanks of a battalion in a tank regiment had been disabled by enemy antitank fire. The action had taken place in a well defined valley just prior to nightfall. The tanks were in a cluster, no one over 150 yards from another and located approximately 1,500 yards in front of a sector held by an infantry battalion which was on the left flank of the tank battalion from which the five tanks were lost. The enemy line was not known, but it was believed that he had observation posts on the hills on the far side of the valley approximately 1,500 yards from where the tanks were located. At about 2000 hours the night of the action the tank battalion maintenance warrant officer reported to the regimental maintenance company CP three miles behind his battalion. He stated that he had learned from the crews that returned that four tanks had been burning and that the fifth one when last seen had only one track partially thrown, but was otherwise unharmed. It was tentatively decided at once to attempt to recover the one tank, but the final decision was to wait for a consultation with the tank battalion commander.

A party was dispatched by the maintenance company commander to go as quickly as possible to the battalion CP and there make an estimate of the situation and a plan to recover the tank. The party sent out from the maintenance company consisted of one officer, five mechanics, and two drivers with one ¼-ton truck and a half-track. It was planned that any additional vehicles or personnel needed would be secured from the battalion itself. The group arrived at the battalion CP at 2130 hours and conferred with the battalion commander. It was decided that the tank was needed badly since there were no replacement vehicles available and the entire Combat Command had been pushed back slowly but surely for the last nine days. There was an extremely heavy fog that had set in during the night and it was customary that this fog did not lift until about 0800 hours the following morning, especially in the valleys. Based on this fact plus the fact that all troops were exhausted from the day's fighting it was decided that the attempt to recover the tank, in addition to any usable parts from any of the knocked-out tanks, would be made at 0600 hours the following morning. With the assistance of the battalion S-3 the officer from maintenance company made the following arrangements.

1. Two squads of infantry were to screen ahead of the tanks one-half hour prior to the arrival of the recovery crew, to protect them from small-arms fire from any enemy patrols that happened to be in the area.

2. Two noncommissioned officers from the engineer platoon supporting the tank battalion were to join the group to check the vehicles for booby traps in case the enemy had tampered with them during the night.

3. Battalion Headquarters would add a medical half-track to the party to pick up the dead in and around the tanks.

4. The battalion maintenance warrant officer and one member of the tank to be recovered were to go along as guides.

The fog held and the party got off in the morning as scheduled. They arrived at 0600 hours at the tanks and were immediately contacted by the lieutenant in charge of the infantry screen. He reported that his squads were in a fight 15 minutes earlier with an enemy patrol and he had three wounded men. Speed was essential since it was obvious that the patrol, or something larger, might return to the scene at any minute. The group worked fast and effectively and at 0740 hours were ready to depart. The tank was ready to move under its own power. Two dead enlisted men and one officer had been put in the medical half-track and the maintenance half-track was loaded with precious guns, assorted equipment, and parts removed from unburned engines. The mission had been a complete success due to the use of initiative, aggressiveness, speed, coordination, and cooperation on the part of all concerned. These qualities were essential in all recovery operations and varied from one operation to another only insofar as emphasis on a single characteristic was concerned, depending on the situation.

Another recovery mission entailed recovering half-tracks which had had to be abandoned during a retreat by a battalion of armored infantry. The majority of the half-tracks in the battalion had bogged down in mud along the cross-country retreat route. The mission as given to the maintenance company of a tank regiment was to recover as many of the half-tracks as possible beyond our own front line as then constituted. The area that should be covered on the ground, and the methods employed, were left, as they usually were, to the discretion of the officer in charge of the recovery. In this case, cooperation and coordination were particularly essential. The half-tracks were generally on a line extending back from our own present positions to the infantry battalions former position, some four or five miles distance. This area was immediately in front of a sector for which the responsibility was divided between a French Artillery unit and a British Reconnaissance organization. Both organizations had to be informed of the recovery plan in detail, and assistance was needed from both. The French had to open a path through their mine field to allow passage of the recovery party out of our lines and also, of course, back in. The British troop contributed about 14 men to act as infantry protection to the recovery personnel, and also as guides, to a large extent, since they had sent patrols through much of the area and had spotted many of the vehicles.

Engineer personnel was furnished by the organic armored engineers and consisted of one officer and three enlisted men. The total number of vehicles the recovery party used were three ¼-ton trucks, two half-tracks, and two 10-ton wreckers. This operation was performed during the hours of darkness and the recovery party was able to go to the area on three successive nights until on the third night they were driven off by small-arms and mortar fire. During the time spent a total of 11 half-tracks were recovered. The enemy recovery parties were not idle during this period, obviously, for it was not until many months later, at the fall of Matur, that the last American half-track, bedecked with German insignia, was rounded up.

There was only one time that an enemy vehicle was recovered from the battlefield with the intention of using it against the enemy. This shortly proved to be tactically unsound, however, from the viewpoint of recovery it was a success. The regimental maintenance company of a tank regiment was ordered to recover an enemy tank in front of our infantry positions and move it back to our own lines into a defensive position from which it could be used to aid the infantry in repelling an enemy attack. An infantry patrol had examined the tank shortly after dark and decided that the only apparent thing wrong with it was that the rear armor plate had been punctured and a shot had hit the engine. They also reported that the tank gun did not appear to be damaged and there were about 30 rounds of ammunition in the tank. The recovery party started from the infantry forward positions at about 2300 hours. The vehicles in the party consisted of two ¼-ton trucks and a 10-ton wrecker.

The personnel were a maintenance officer, in charge, and seven enlisted men from maintenance company. They were three vehicle drivers and four mechanics. In addition to the maintenance company personnel, one engineer officer and two enlisted men were in the group. A squad of infantry preceded the recovery party by one hour and formed a light screen around the tank. The engineer personnel quickly checked the vehicle for booby traps at the same time the tank was being made fast to the wrecker. The entire operation went very smoothly. It was expected that enemy fire would be received as the tank was dragged onto the concrete road which led back to our lines because of the noise which the tank tracks made on the road, however, the wrecker went so slowly that there was very little noise and our lines were reached without incident. The tank was put in position as requested. As was mentioned the idea did not work out tactically as planned. Two days later the enemy took the position held by our infantry and with it their tank.

Another recovery mission worth mentioning occurred the day the break out of the Anzio beachhead took place. One of the tank battalions leading the attack in their zone lost about 35 tanks almost immediately after they crossed the line of departure. The majority of these tanks were lost due to hitting uncharted friendly mines and some due to enemy fire. The large number of tanks lost plus the uncertainty as to the outcome of the engagement required that action be taken rapidly to recover the tanks. The regimental maintenance company was given the task of commencing recovery without delay. An officer from the maintenance company was assigned to coordinate all recovery work and to get it started as quickly as possible.

Actual hauling of tanks from the battlefield was begun not many hours after the battle began and continued all day and all that night. Throughout the day operations were hampered by mortar and artillery fire as well as by mines. The engineers supported the maintenance personnel with tank dozers and by clearing lanes through the mines to each tank. They carried on in excellent fashion throughout the night, and without their aid the majority of vehicles could not have been recovered. In this case all available recovery vehicles were pooled under direct control of the maintenance company and an advance repair unit was set up immediately behind the front in a defiladed area and included among other things a 2½-ton welding truck and a portable welding trailer as well as two 2½-ton parts trucks. Practically all of the initial tanks disabled had to have only repair to their suspension systems so that once the vehicle was removed from the scene of battle it was a fairly fast repair job for an efficient crew.

It was a tribute to the aggressiveness and cooperation on the part of everyone who participated in the recovery and repair of these vehicles that on the following afternoon 30 of the 35 original disabled tanks had rejoined their companies.

From their numerous battlefield recovery experiences the maintenance personnel of the Division built up a wealth of knowledge in methods to be used and measures to be taken in order to carry out successful recovery missions. This knowledge was incorporated into unwritten Standard Operating Procedures over a long period as each new experience contributed its lessons. If it were necessary for an experienced maintenance officer in the 1st Armored Division to consult a guide sheet when he had a recovery mission toward the latter part of the war, it would resemble the following:

A. *Planning*—Every phase of a recovery operation should be planned in minute detail from beginning to end. No matter how rushed the officer is, and he always will be rushed, no details can be left to chance. As in any phase of military operations, planning is quicker and easier with seasoned troops, but regardless of the experience of the personnel, the making of detailed plans and the close supervision of the execution of these plans is the sole responsibility of the officer in charge of the recovery operations.

1. Vehicles and personnel to take part in any operation must be carefully selected. The personnel must be the most skilled technicians available. They must be rapid workers and when possible volunteers. The vehicles must be the right ones to do the job, and the total number employed must be as small as possible without sacrificing unduly the efficiency of the group. The greater the number of vehicles and personnel used the greater the chances of attracting enemy attention.

2. Coordination and cooperation are inseparable essentials. It must always be borne in mind that vehicular recovery immediately after a battle is more often than not of secondary importance to everyone excepting the maintenance personnel charged with the job, and their commanding officer and his staff. Yet all the activity related to the planning stage of recovery and the recovery itself necessarily rests upon a certain amount of assistance from battle weary personnel to whom the most important and wonderful thing in the world is, at the moment, rest. Cooperation must be secured from all personnel outside the maintenance company who are deemed necessary in the operation, and their efforts must be closely coordinated with those of the maintenance group. The securing of this cooperation and coordination rests with the officer in charge of the recovery practically 100 per cent.

3. Never attempt a recovery mission without reliable guides. Operating at night over strange terrain with the mission of locating a relatively small object or objects will play havoc with the most experienced map reader, compass reader, or astronomer. This is especially true in wide open territory where distinctive landmarks are few.

4. Never neglect security measures. It will save lives and limbs to secure competent personnel to locate booby traps and mines. Use dismounted troops as listening outposts as well as to deliver fire on wandering enemy patrols. This will give the working party a greater sense of security and thereby increase its efficiency immeasurably.

B. *Orientation*—Orient every man who is to take part in the recovery as to what the general picture is, where the vehicle or vehicles are located, and what their reported condition is. Show them the terrain if possible, and explain what the situation is tactically in the area. In addition to giving everyone the general picture tell each one specifically what part he is to play in the operation.

C. *Speed and Aggressiveness*—At best in performing a recovery operation the group is pressed for time. Lacking speed in both the planning phase and the execution a recovery mission is almost certain to be a failure.

All members of the recovery party must be aggressive, particularly the leader. This does not mean the taking of foolhardy, needless chances, but rather a very rapid estimate of the situation must be made and then coupled with positive action. The goal sought must be weighed against the danger involved and a spot decision made and carried out unwaveringly.

Tank and other vehicle recovery was a very small phase of the 1st Armored Division's activity in World War II. The methods used were justified by the equipment available and the conditions under which the Division fought. What contribution was made to the over-all efforts of the Division by vehicle recovery crews cannot be accurately evaluated. It is certain that they helped to keep a Division rolling that started fighting in November 1942 with tanks which were obsolete even then and for which spare parts and replacements were slow in arriving, to say the least.

# The Light Tank, Past, Present and Future

*by Lieutenant Colonel R. M. P. Carver**

THERE are few problems which cause a General Staff and the tank designer as great a headache as that of obtaining agreement on the specification and design of a light tank. The argument must, in the end, become the obvious one: is a light tank needed, and if so, for what? There are many who deny the need for it, and maintain that production of light tanks is a wasteful diversion of resources and manpower, both in production and the Armed Forces. In this article I propose to consider why light tanks existed in 1939, how they developed and were used during World War II, and what their future may be.

The British developed the light tank between the wars for a variety of reasons. First of all it was cheap; and in the days of peacetime economy and expanding armored forces, it was considered better to have light tanks than no tanks at all. Secondly, it could be used with great effect for policing, and was so used in Palestine and on the North-West Frontier of India. Thirdly, it could be exported; other nations which could not make their own, such as countries of the Middle East, and republics of South America, wanted to have at least a token force of tanks, and did not want to pay too much; the light tank was, therefore, a commercial proposition.

### First In The World

Finally the military theorists of the day, led by General Fuller, had great faith in speed alone as a factor of military strength; in peacetime maneuvers the effects of fire power, of administration, of cooperation and coordination with other arms and services, and all the other factors, which determine the timing of military operations, are apt to be neglected; and soldiers, particularly highly theoretical ones, are liable to think that the art and business of war is purely a matter of movement, like a game of chess.

In the First British Tank Brigade, which was formed in 1931 as the first armored formation in the world, there were originally three mixed tank battalions, each consisting of two medium companies and one light company. In 1934 the Brigade was reorganized into four battalions; one light tank battalion of three light companies, and three mixed battalions, each of three mixed companies, the company consisting of headquarters, a medium section of five medium tanks, equipped with 3-pounder guns, a close support section of two close support mediums carrying 3-inch howitzers, and a light section of seven two-man light tanks, carrying one .303-inch machine gun. At about the same time, armored car companies in Egypt, Palestine and India began to be re-equipped with light tanks. From 1935 onwards the two-man light tank began to be replaced by the Mark V and Mark VI, a three-man light tank, weighing about 5 tons, mounting one .5-inch and one .303-inch machine gun, and of an armor thickness of 14mm. The light battalion of the Tank Brigade was hurriedly sent out to Egypt in 1935 at the time of the Abyssinian crisis, recalled to England in 1936, and sent out to Egypt again at the beginning of 1938. It was the only completely equipped armored unit in the British Commonwealth of Nations.

### Three Types

At about this time the German Army, having thrown off the shackles of the Versailles Treaty, was beginning to form, train and equip armored formations. It was faced with the need to produce a large number of tanks in a short time, on which to train the new armored units. They followed the British example and produced the Mark I, a 5½-ton two-man light tank, mounting two machine guns and having 15mm of armor. By 1936 they had turned over to the Mark II, a 9½-ton three-man light tank, mounting one 20mm and one 7.92mm machine gun, and having 30/35mm of armor. These were both tried out in Spain, as a result of which design was started in 1937 on the Mark III, a cruiser tank of 22 tons, and Germany dropped light tanks altogether, although the Mark II was still in action at the end of 1941.

From 1937 onwards the British were developing three types of tank, the heavy "Infantry" tank, which be-

*British Armored Force Officer.

came the Matilda, the cruiser type, which became the Crusader and the Valentine, and a light tank, which became the Tetrarch, a 7½-ton three-man tank, mounting originally a 15mm machine gun, later on a 2-pounder gun instead, and a 7.92mm machine gun, and carrying 16mm of armor. The Tetrarch did not come into service until 1942 and was only used as an airborne tank: its final development was the Harry Hopkins, weighing 8½ tons, also mounting a 2-pounder and a 7.92mm machine gun, with the armor increased to 38mm. This tank was produced too late to see action.

By 1939 U.S.A. were developing two types of tank only, the medium M3, designed primarily for the support of infantry, and the light M3, combining in one tank the requirement for the cruiser type and the reconnaissance tank. The original light M3, called by the British the General Stuart, weighed 12½ tons, mounted a 37mm gun and two .300-inch machine guns, carried 44mm of armor and had a crew of four. It was, therefore, the equivalent of the British Crusader, which weighed 19 tons, mounted a 2-pounder gun and a 7.92mm machine gun, had an armor thickness of 50mm and also carried a crew of four.

### Idea Discarded

In the years immediately before the outbreak of World War II, the British were expanding their armored forces as rapidly as they could by the conversion of cavalry to tanks and armored cars. The only tanks available in any quantity were the light tanks Mark VI, and, when war came, these provided the great majority of the equipment of the British armored forces. The short campaign in Belgium and France in 1940 showed how useless they were; but they were still in action in the Middle East up to the end of Wavell's campaign against the Italians in February 1941, in Greece, Crete, and Syria in the summer of 1941, and as the equipment of the Australian and New Zealand divisional cavalry regiments and with the British units inside Tobruk up to the relief of Tobruk in November 1941. They were tolerated as reconnaissance vehicles because there was nothing better, but they could hardly be regarded as tanks.

In the summer of 1941 the first American M3 light tanks reached the British in the Middle East. They were regarded and used as cruiser tanks, the primary equipment of armored regiments (tank battalions), with which to fight the German Mark III and IV tanks. They were no match for them, but were as good as anything the British had and more reliable; their disadvantages in comparison were their short range, need of constant refuelling, and the cramped space for the crew in the fighting chamber. By now the idea of needing two types of tank, a cruiser and a light, had been discarded, and every tank was required to carry a gun and armor which would enable it to fight the German Mark III and IV on equal terms. By May 1942, when Rommel attacked near Tobruk and drove the British back to Alamein, the British had received a number of American medium M3 tanks, which they called General Grant and General Lee. Their 75mm guns were the only tank guns which could take on the German Mark III and IV. Because there were not enough to equip all formations, armored regiments (tank battalions) were organized into two squadrons (companies) of mediums and one squadron of either M3 lights or British Crusaders. The conception of a mixed unit of medium and light tanks again appeared therefore, not because there were any tactical need for it, but because there were not enough medium tanks to go round.

### Invasion Experience

For the Battle of Alamein in October 1942, the British had received a considerable number of American medium M4 tanks, which they called Shermans. Again, because there were not enough tanks to equip all formations entirely with mediums, armored regiments were equipped with two squadrons of medium M3's or M4's and one squadron of either light M3's or British Crusaders, a few of which now mounted 6-pounder guns. The Australian and New Zealand divisional regiments now had light M3's, other divisional cavalry or reconnaissance regiments, if they existed, had armored cars and bren gun carriers. This remained the British organization up to the end of the campaign in North Africa, except for tank brigades earmarked specifically for infantry support, which were equipped entirely with Valentines in the Eighth Army and Churchills in the First Army. From Alamein onwards the need was felt for a small reconnaissance troop within the armored regiment: in North Africa this was equipped with ten two-man armored wheeled scout cars.

For the invasion of Sicily and Italy in 1943 the British armored forces were equipped entirely with American medium M4 tanks. There were a number of commanding officers who had become so accustomed to having a light squadron that they wanted to keep one squadron of light M3's or Crusaders; but experience in Sicily and Italy soon proved that it was far more important to have three completely interchangeable squadrons, all capable of developing the greatest possible fire power. Experience there also confirmed the need for a reconnaissance troop: in Italy these were equipped half with scout cars and half with bren gun carriers. The troop provided six patrols, each of two vehicles, three patrols in carriers and three in scout cars. The organization proved sound, but the cross-country capacity, speed and reliability of the carrier were inadequate. The carrier was therefore superseded by the American light tank M3A3 or M5A1, in some cases with the turret removed.

For the invasion of Normandy and up to the end of the war, reconnaissance troops were equipped either as described above, or else with light M3A3 or M5A1 tanks throughout, the number of patrols being reduced to five in the latter case. Apart from airborne recon-

naissance regiments, these were the only light tanks in the British forces, divisional reconnaissance regiments being equipped with armored cars and bren gun carriers. At the very end a few reconnaissance troops of armored regiments were equipped with American M24 light tanks, called Chaffee by the British.

### Conflicting Needs

Unlike the American armored forces therefore, the British in the last two years of the war only used light tanks in reconnaissance troops of armored regiments and in the airborne reconnaissance regiments. For the former they relied entirely on American light M3A3, M5A1 and finally M24; for the latter they used the Tetrarch and developed the Harry Hopkins; for the same purpose the U.S. armored forces produced the T9E1, later renumbered M22, called Locust by the British; it was a 7½-ton three-man light tank, mounting a 37mm gun and a .300 Browning machine gun, having an armor thickness of 25mm. The Germans never attempted to produce another light tank after the Mark II, relying on three-quarter track armored vehicles and armored cars for reconnaissance, nor did the Russians as far as I know.

Since the end of the war there has been considerable discussion both in the United States and in Britain about the need for a light tank and its specification, particularly in view of the great problems of movement presented by the weight and size of medium tanks. The difficulties in deciding on the specification arise from the conflicting demands of the various possible users. The uses for which it is needed are: first for airborne forces, secondly for reconnaissance troops of armored regiments, thirdly for divisional reconnaissance regiments; finally it would prove very useful for internal security purposes with armies of occupation and in undeveloped countries such as the Middle East, Indian Ocean, and Pacific areas, where communications might preclude the use of heavier tanks. For the local defense of Dominions and Colonies of the British Commonwealth, it would also be useful to deal with airborne and seaborne landings. The trouble is that all these requirements conflict and a compromise produces a poor tank which suits nobody well.

For airborne forces limitation of size and weight is obviously essential and range is not important. The airborne soldier needs most protection against armored vehicles and fire support, and is probably prepared to sacrifice armor. The reconnaissance troop of the armored regiment needs mobility, range and reliability; its light tank must be able to go where the medium tanks go, and many places to which the mediums cannot go, its main task being ground reconnaissance. It must be able to go about one and a half times the distance of the medium tanks in the same time, and, therefore, needs one and a half times the speed and range of a medium. Armament is of little interest, the main armament of the medium tank producing all the fire power needed, both armor piercing and high explosive. Mobility, silence and inconspicuousness are more important than armor protection. For this the tank must be of a certain size to negotiate obstacles, and must be light for its size and have the high power-to-weight ratio and a low ground pressure needed to give it a good cross-country performance.

### Reconnaissance Fallacy

To the commander of the divisional reconnaissance regiment the light tank is the most powerful weapon he has. He wants to be able to take on enemy tanks, if he meets them, and give his reconnaissance troops, whether they are in armored personnel carriers or on their feet, the fire support which he probably cannot get from anywhere else at the time. He always tries to get as big a gun and as much armor as he can within the limits imposed by the divisional bridge. For internal security and local defense against airborne and seaborne landings the requirement is much the same, except that for internal security accurate high explosive is useful and armor piercing capacity is not needed.

A compromise between these demands is likely to produce something very like the British cruiser tank of 1943 with a bigger gun and, therefore, less space and little ammunition, and no more than average mobility, if that. It would not suit anybody well and least of all the airborne forces and the reconnaissance troop of the armored regiment. I believe that to pay too much attention to the armor and armament of a light tank is wrong; in my opinion, based on experience with tanks for over 12 years, including fighting in the desert from the earliest days, in North Africa, Italy and from Normandy to the Baltic, the idea that reconnaissance units operate ahead of other units and formations, and have to brush through enemy forces, is a fallacy. In an advance or a pursuit, the right way is to make up your mind where you want to go and put strength at the head on the essential axes or advance. This strength is provided by the medium tanks of armored regiments in armored brigades. The task of reconnaissance regiments is to watch and cover flanks and gaps between the main axes of advance; they do not need fighting tanks for that. Both American and British Forces these days are organized so that there are enough tank battalions to see that infantry divisions have medium tanks with them when they need them; they should never be called upon to lead an advance or pursuit without.

If this is accepted, a light tank could be designed which was primarily a reconnaissance vehicle; it could then have a really good performance across country, which a more heavily armored tank with a large gun cannot achieve; it would probably be light and small enough to suit airborne forces as well; and as long as divisional reconnaissance regiments were not misused, it would suit them too; but unless it is a really good reconnaissance vehicle, I consider it a waste of resources and manpower to produce it.

# Tank Development and Production 1939-45*

*by Lieutenant Colonel R. M. P. Carver*

**(Editor's Note: Lack of space prohibits the publishing of General Martel's article, however, Colonel Carver's comments are clear enough for the reader to understand both viewpoints. Colonel Carver is a former Brigadier and one of Britain's foremost authorities on Armor.)**

AT the risk of being accused of flogging a dead horse, which General Martel has flogged so tirelessly and in so many places already, I feel that I must call attention to certain statements in his article in the February number of the *Journal* which are misleading and inaccurate.

First, the vexed question of the gun. General Martel admits that the decision to continue production of tanks with two-pounder guns was made at the expense of a quicker conversion to six-pounder, on the ground that to abandon the two-pounder would have delayed production. What he does not explain is why, when according to him a pilot model of the six-pounder had long been available, it only appeared in tanks in the field, and then only as a hasty modification in a Crusader, which was not designed to take it, at the same time as the 75mm in the Sherman, a gun of infinitely better performance, in a tank and turret for which it was designed, having been developed and produced apparently in a far shorter period than the six-pounder. I do not suggest for one moment that blame for this can be attributed in any way to General Martel. He infers that the War Office could have made no other decision and that delay was primarily due to bad organization in the Ministry of Supply. That is not the whole truth; it is time that the truth of this matter was fully investigated and made public to ensure that we do not suffer again from a repetition of such mistakes.

Secondly, his statements about the Cromwell are misleading. He says—"The Cromwell tank began to arrive shortly after Alamein and was in full production in 1943." "Began to arrive" is misleading when it is remembered that it first saw action in Normandy in June, 1944, and that only a very small proportion of British tank units in all theaters were ever equipped with it. Its margin of superiority over the Sherman, which had been in action since October 1942, was very small; it had the same gun, although originally designed for and equipped with six-pounder, which was originally inaccurately mounted, and carried less ammunition—only 64 rounds compared to the Sherman's 96. It had the same frontal armor on the turret, with a slight increase on the front of the hull and the sides, but not enough to make any difference to the German antitank guns then in use, 75mm and 88mm. It is not true to say that it was more reliable than the Sherman; it was probably on the whole equally reliable, in spite of a few mechanical failures, in clutches and idler wheels, which caused us much anxiety shortly before D-day. It certainly had a longer engine life than the Sherman II, but no longer than the Sherman III. In any case engine replacements for Sherman II were available in plenty. I do not deny that the Cromwell, as issued at the beginning of 1944, was an improvement on the Sherman; but it was only a very slight improvement and by no means obvious, as I know well, having had the task of putting it over to the armored regiment which I commanded at the time and which was being re-equipped in England with Cromwells preparatory to D-day, having had Sherman III's in Italy and North Africa, and having learnt by bitter experience in every action since the beginning of the war in the Western Desert to trust American and distrust British tanks. It is a tribute to the Cromwell to say that they were converted but not without difficulty nor without the presence of the Sherman 17-pounder in every troop. General Martel quietly omits all mention of the scandalous story of the Cavalier and the Centaur, large numbers of which were produced, none of them fit for battle.

Thirdly, the Churchill. General Martel states that during 1942 the Churchill was the best heavy tank in the world. Apart from four which took part in the Battle of Alamein as an experiment and those which took

*Journal of Royal United Service Institution.

part in the raid on Dieppe, which were not conspicuously successful, they first appeared in battle with the First Army in Tunisia. Some had six-pounders, but a large proportion still had two-pounders. To compare them with Tigers, which appeared on the same battlefield at the same time, in February 1943, and had already appeared in Russia, is ridiculous. He adds that the Churchill performed splendidly in North Africa and Italy, adding that "some of the tanks had six-pounder guns and some had 75mm dual purpose guns." He omits to state that up to the end of the North African campaign, no Churchill had a gun larger than the six-pounder and many had two-pounders; that no Churchills were seen in Italy until 1944, as none could be equipped with 75mm in the Mediterranean theater until then; and that two-thirds of the Churchills in Normandy still had only six-pounders.

General Martel consistently conceals the fact that the Churchill was always grossly under-gunned. Although it did good work in many places, it suffered from being unsatisfactory both as a cruiser tank and as an infantry tank; for the former role it was too clumsy and slow, as well as being under-gunned; for the latter role it was under-gunned again and under-armored, being easily penetrated by both the 88mm of all Marks, and the 75mm Kwk 43 of the Panther. Whatever General Martel may say in praise of it, it is doubtful if it would have made the slightest difference to the War had the Churchill never existed and had we had Shermans or Cromwells instead. Considering all the facts and circumstances affecting its design and production, it is probably fair to say that the history of the Churchill is the least unsatisfactory chapter in the story of wartime tank development and production. Originally designed as a purely assault tank with a maximum speed of 10 m.p.h., its final form in the shape of the Crocodile flame-thrower is a tribute to what can be done to make the best of a bad job.

Finally, the vexed question of whether British production should have been concentrated on the Comet or split between the Comet and a "heavier" successor to the Churchill. General Martel states that if it had not been for the decision to concentrate on the Comet "the next model of an infantry tank could easily have been produced in limited numbers for use in the close fighting in Normandy . . . if this had been done, the infantry tank which we would have produced would have blown the Tigers and Panthers clean off the battlefield." In making this statement General Martel appears to disregard both time and numbers. If these tanks were to have been used in Normandy, they would have had to be available for issue to units who were to fight in them at least by the end of February 1944, and considerably before that to the Armored Fighting Vehicle schools and proving establishments. The Comet was in fact first ready for issue to units in the field in January 1945, and first used, owing to delays in re-equipment caused by Rundstedt's Ardennes offensive, at the end of March, 1945. In any case there were only enough to equip one brigade. It seems unlikely therefore that the new heavy tank would have been available before then, and doubtful if more than 100 would have been available—a mere fleabite.

The tank to which General Martel probably refers was known as the Black Prince. It was to have been an improved version of the Churchill, carrying a 17-pounder gun and 150mm of frontal armor. It would have had therefore no better armament than the Sherman 17-pounder, which was available in Normandy in the proportion of one to every three 75mm, and in double those numbers by the end of 1944, in every armored regiment in Northwest Europe equipped with Sherman or Cromwell. The Sherman 17-pounder was effective against the Tiger and to a limited extent against the Panther. General Martel omits all mention of the existence of the Sherman 17-pounder; and it is a gross exaggeration for him to suggest that the Black Prince "would have blown the Tigers and Panthers clean off the battlefield," when its armament would have been no better than the Sherman 17-pounder, which was equivalent in performance to the 75mm Kwk 43 in the Panther and inferior to the 88mm in the Tiger, quite apart from Jagd Panthers and Jagd Tigers; when its armor could have been penetrated, as the heavier Churchill's often was, by 88mm and 75mm Kwk 43; and presuming that it would have been available in time, which is highly unlikely. If General Martel is not alluding to the Black Prince, but to a much heavier vehicle which owed its conception to Mr. Duncan Sandys, his argument holds even less water. If by some miracle that vehicle had been produced in a battleworthy state, production could never have been got under way in time for even a limited number to be available in Normandy.

At the end of my previous article,[1] I said that we must not, for reasons of economy, allow ourselves to lag behind again, and that tank design and development must forestall the demands of the user and not wait upon them. There is one further lesson, which now seems to me equally important, and that is that the productive capacity of Great Britain for tanks is so small, both in peace and war, presuming that we shall still need to produce our own ships and aircraft, that we can never hope to produce enough to equip all the armored units that we need, let alone supply the Dominions or any Allies also. The British Empire relied mainly on American tanks during the late war, and will clearly have to do so again in another war. The attempt to be self-sufficient ourselves—we had to be at first of course—led us to sacrifice quality for quantity and to hesitate to make improvements for fear of interfering with production. The result was that a vast amount of man-hours and material was wasted in producing tanks which were not fit for battle when completed.

[1]See "Tank and Anti-Tank" by Brigadier R. M. P. Carver, in the September-October, 1946, issue of the ARMORED CAVALRY JOURNAL.

# The Horse In The Recent War*

## by Captain Eric Hardy, F.Z.S.

IN one of his interesting articles in *The Horse* just before the end of the war, Lieutenant Colonel Engel, writing upon balance and the rider, noted that it was a great disappointment to those Army officers who had spent their whole life in the study of the horse to find that the U. S. high command had no use for cavalry in this great war. That in essence is true, but it should not be overlooked that despite the growing habit of calling the recent war a mechanical war, as if it were won by tanks and atom bombs alone, the history of the war from its early stages in 1939 to the culmination in 1945 saw very wide and considerable use of the war horse, and not all this was the work of the Russian cavalry. I came home from the war to find many civilians astonished to hear that even camels pulled the Russian guns during the defense of Sevastopol, that reindeer pulled the ammunition and ambulance sledges for Finnish and Russian armies during the siege of Murmansk, that oxen pulled the heavy infantry transport of the French Army, and an official Allied Elephant Force operated against the Japs (who had such a force of their own) in the Burmese jungles. Horses ended up still the most practical and economic method of scouting, holding, and patrolling mountainous country in the wilder less civilized parts of the theaters of campaign.

On maneuvers it is very easy for military authorities to show the advantages of the fast reconnaissance tank, the jeep and the armored car over the cavalry horse, and of the light or heavy truck over the horse transport for the infantry platoon. But in wild hills whence battle often races before engineers have time to construct roads or railways unwanted in peacetime—as the German sweep toward the Caucasus before their defeat at Stalingrad saved the Near East—you just have not got mechanical transport *ad lib,* and all you can commandeer from the local population are a few chromium-plated taxicabs which are little use off the hard road. Is every war to be fought in the vicinity of industrial towns with their plants to produce the vehicles? Horses can be gathered quickly in most countries; mechanical vehicles in large amounts in very few. The mechanical strength that won the British battle of Alamein was the result of a long and anxious "build-up" by the immense sea route around the Cape of Good Hope. The broad, flat desert of North Africa gave the tanks room to maneuver: the high hills of many parts of the world —northwest India, Syria, north Italy, the Balkans, the Rockies—are full of death traps to armored vehicles travelling along narrow, winding ravines, unable to assail the steep precipitous hills in the hands of the enemy.

The highly mechanized German Army was as realistic and thorough as most German things: it conserved its most vital powers. It used a million horses for its Infantry transport—each German Infantry Platoon was equipped with one horse-drawn wagon for supplies, compared with the British infantry platoon's 15 cwt. Ford or Morris truck. Truly in the retreat after the Ardennes push, those German infantry horses had a gruelling time, and most of their drivers were compelled to turn to the river beds in the snow-covered country left by the blizzard, and flog their horses and wagons knee-deep through icy water, for the rocky stream bed was then the only firm ground in the country. Their mechanical transport was bogged down. Earlier, in their invasion of Poland in 1939, the Germans used 200,000 horses to follow the armored spearheads. In those long supply lines to the German Armies battling with futile effort in Russia, peasant transport horses from all over Central Europe toiled, and died, to be torn ravenously asunder by the starving slave workers and the suppressed nations, for meat. At the fall of Paris the victorious German troops rode in on horseback.

What of the riding horse? British yeomanry mounted cavalry served in Palestine in the early part of the war, for the Palestine Police Force mounted division had long found the horse patrol the most successful method of covering the great, lonely mountain ranges of central Palestine. The Syrian campaign against the Vichy French, who were permitting German planes to use their airfields, was conducted with a large number of mounted cavalry on both sides. French cavalry are very tough, and although they fought against us in Syria, they fought against the Germans in North Africa with

*The Horse, March-April, 1947.

their fast riding Spahis. Arab cavalry from Transjordan also took part in the Syrian campaign. Cavalry patrolled the haunts of pro-Nazi tribes along the Afghan frontier of India. Japanese officers appeared in Malaya in the early Japanese push after Pearl Harbor mounted on small, wiry Oriental horses, for the Japanese invading infantry platoon travelled light and had no room for mechanical spares and petrol for mechanical forces. And the horse is the only transport I know that will travel light, feeding off the local land.

It will be remembered that one of the war trophies of the Allies was Rommel's white Arab stallion, which British troops captured at the German remount depot in Schleswig Holstein. It was the horse procured specially for Rommel to ride into Cairo, only the battle of El Alamein changed those plans. It was a fast little white eight-year-old horse.

The main use of mounted horses in the war, by the Russians and the United Nations, was as scouts, on the Eastern European front for infiltration, in the mountains where low gear motor transport was slow or impossible, and in winter when mechanical transport bogged down too quickly in mud or snow. In the mud of the campaign in the mountains of North Italy the mule proved itself over and over again at an advantage over mechanical transport. Mule transport again had its value in the jungles of Burma, where only native tracks existed, and not even a jeep could negotiate many of these in dry weather, let alone in the monsoon. So the Royal Indian Army Service Corps had its special mule training regiment, often with imported Argentine mules, which were trained for the Burma campaign by leading them down a slippery slide, and then water was poured over this to make the foothold more precarious, and when used to that they negotiated it with a pack. They were trained to the ordeals of dive-bombing by merely standing under the typical fair ground swinging model airplane-roundabout, which circled and swooped harmlessly over their heads until they gained confidence.

Here is an actual battle report, in summary, of a task accomplished by General Kirichenko's Kuban Cossack cavalry corps, in a combined operation with General Tanaschishin's tanks against the southern German Army Group, effecting a successful breakthrough. There were three phases to this operation. First, the cavalry were moved up to a position behind the infantry who were making the assault. Immediately following the assault, they were hurled into the breach. Their final phase was the traditional "operation in depth" into the enemy's lines.

Security necessitated utmost precaution against enemy reconnaissance and intelligence guessing their first phase; so the divisions moved up in secret and fanned out in widespread fingers that would not close to their attacking point until contact with the enemy and their presence became known. So all day long the cavalry hid their horses in the fields of tall maize that stood ripe upon the rolling steppes, while the infantry fought to clear a way for them. German reconnaissance planes actually flew over the fields without detecting the Cossacks standing holding the heads of their horses to avoid the animals taking fright, or neighing, or attracting attention. The blue-capped Cossacks were reported to have thrust their caps into the animals' mouths to prevent their whinnying with alarm as the German planes circled over the steppes and swooped low over the fields. They kept their horses like that until sundown, when the infantry began to break through.

At zero hour German intelligence was still ignorant of the presence of the cavalry, so the first reconnaissance was given to a tank unit under Captain Novikov. Colonel Karapetyan commanded the leading cavalry regiment in advance through a narrow gap specially laid in the Russian artillery fire. Captain Kuznetsov led the first Cossack squadron in light battle order—no cloaks, hoods or tunics. They went right through the gap without detection by the Germans, who were listening for tanks in the night! When the first German-held village was reached, the Russian tank captain merely lined up his tanks, "revved" up their engines, and the roar gave the German troops such an impression of a force of tanks advancing against them that uncontrolled fire broke out. Thereupon in the confusion, the Cossack cavalry dismounted, approached silently and took the village by the first assault.

In that night advance the Cossacks penetrated 22 miles into the enemy lines—because horse transport at night is silent and unseen. The Cavalry corps followed. Ever since the summer campaign of 1943 Soviet cavalry commanders had become past masters in the art of maneuvering for encirclements by flanking drives. That was the plan followed in this instance. "Encircle, divide, destroy"—how old the theory, how modern its usage! The three Cossack cavalry divisions were given the relative tasks to chase, to destroy and to complete the annihilation. So soon as Captain Tutarinov's division, which had the first task, cut this lane through the German force, Russian cavalry and tanks straddled the road, enemy communications were disrupted, and every German unit for sixty miles around was left to do what every German unit is most loath to do—act on its own devices. Having got their fuel, ammunition and dumps, the Russians had the German fighting units by their throats. The Cossacks had the task of attacking the flanks and the rear of the enemy in this battle, and in the first phase they cut off and destroyed the bases of three German infantry divisions and one tank division.

From an animal lover's point of view, however, one hopes that, firstly, there will be no other war, and, secondly, if human nature fails again, then the horse will be exposed to as little danger and suffering as possible. The recent war was at least some improvement upon the wretched position in the first world war when 5,000 horses an hour were being killed in the battle of the Somme.

# The Horse In Early America*

## by Colonel Edward N. Wentworth**

MAN has always known the horse. Way back in prehistoric days it had acquired most of the qualities for which we now value it, twenty million years before man had learned to stand on his own feet. The horse is probably the oldest existing mammal in time of origin. Man is the youngest. There is something appropriate in the association between them, while both have ascended the evolutionary ladder—the same kind of association that prevails when the older child helps the younger, or the strong assists the weak. The horse carried man to the conquest of the temperate world, and provided the power that led him along the first mile from complete dependence on his home acre to the industrial specialization of today. The horse emancipated man from the hoe, and the unit of work that he did carries over to the engineer's modern machinery, when motors, engines, and power plants alike are rated by their horsepower.

The foregoing thoughts may seem afield in considering early America, but what was early America, and when was it? Some may say during Colonial days, some may say before Columbus. But equally well one can say—millions and millions of years ago! Way back before the age of the glaciers, and the period before that—yes, back four long geological periods before the glaciers, the horse was in America. Way back in the period called the Eocene—the dawn of the modern, if one may interpret the word from its roots. In that period, the great reptiles which had dominated the world for many preceding ages had disappeared—the animals that the advertising department of the Sinclair Oil Company restored in effigy for our entertainment—and tiny little mammals, the size of cats and foxes, were starting down the long path to the present. One of these animals was Eohippus, or dawn horse. Already leading other mammals in the evolutionary program, it had four toes in front and three behind, and was just that much nearer to the speed and fire for which we admire horses today, than the five-toed ancestors of the deer, ox, sheep, goat, wolf, dog, or cat. In fact, the American horse of that era was ahead of the European, for the latter still carried vestiges of the toes which Eohippus had discarded.

Most of the prehistory of the horse took place in the western hemisphere, but when white men came it had been gone so long that the Indian had no tradition of any animal like it. He looked on it as a god, or at least as a Centaur, for the first Indians who saw a Spanish conquistador dismount thought the animal was coming apart. Perhaps they were anticipating that disintegration that came with the atomic bomb of 1945.

But we should devote a little more time to prehistory before getting too modern. Back in the Ice Age, or Pleistocene, in the intervals between the advancing and receding glaciers, our plains had millions of horses that resembled the western cow pony, and that varied from ten to fifteen hands in height. Why did these horses disappear? Judging by the rapid spread of the wild horse which escaped domestication when the white man brought him back here, the western plains were their natural home, and a catastrophe must have occurred to wipe out the species so completely. Evidently that is what happened; for not only did the horse disappear, but so did the elephant, the camel, and the North American tapir.

The nature of that catastrophe has aroused much speculation. It was not due to the horse's inability to adapt itself to the cold of the glacial period, for the wild horse of the Asiatic steppes survives fully as cold a season, and has developed a remarkably thick coat. During the settlement of the West, early ranchers were quite successful in raising horses on some of the coldest ranges in Oregon, Nevada, and Idaho, where cattle and sheep failed in the face of the severe winters. Furthermore these prehistoric horses were able to move to better winter climates, for they apparently migrated seasonally the same as bison did a century ago.

The cold may have had other effects though! One theory, not too good, is that a series of cold snaps may have occurred, during which the horses lost so much strength that they became easy prey for the wolves and other predators. It is difficult to believe this, however, as horses were so well distributed that a series of cold snaps could not have caught all of them. Nevertheless, unusual cold could have affected the growth of feeds, and the lack of feed could have postponed or repressed the breeding cycle, or enfeebled the mares at foaling time. If, in one season only, there were ice storms, crusted snow, sleet, and prolonged cold, with further chills at foaling time, the stallions and mares might have been too weak to protect the foals, and the pred-

*_Horse and Dog Lover_, April-May, 1947.
**Director of Armour's Livestock Bureau.

ators would gradually have gained the upper hand. During the Glacial Period, a great winter snow blanket covered the grass for many months, and even though horses can paw away three or four feet of snow, they might have had to travel so far during such a season, that they could not get enough nourishment to maintain their lives. The historic range winter of 1886-87 was of this types. More than half the cattle in the northwest range states were lost, and deaths among horses were greater than in any other winter.

While this theory has had many sponsors, it does not explain the simultaneous disappearance of tapirs, camels, and elephants, nor why bison, elk, deer, and other herbivorous animals not as hardy as wild horses managed to pull through. Hence some other interesting ideas have been advanced, none of which can be supported by evidence. One of these is that the long winters and intense cold may have diminished the numbers so much that the bands of mares and foals became intensely inbred, lost their fertility, and died out. This theory is not very convincing in the face of survivals of inbred bands of stallions and mares on isolated islands. Others have observed the effect of overgrazing on the western range when poisonous plants gradually took over the range. But horses are so much more adaptable to changes in environment than other grazing animals, and have such strong instinctive and protective reactions, that it is difficult to believe that some of them would not have migrated out of an overgrazed country, and been the ancestors of enough horses to restock the area when conditions changed.

The most plausible theory advanced so far is that horses died out from diseases transmitted by insects. In the intervals between the glacial advances, the seasons were wet and insect life flourished. Many dangerous diseases in modern times are borne by insects, such as the *tsetse* disease in Africa, or *surra* in India, which cause death quickly. An example of the kind of disease that might be involved was the sleeping sickness in horses, carried by flies and other insects, that affected so many states a few years ago. Professor Cockerell of the University of Colorado, a great authority on fossil insects, has discovered remains of two species of *tsetse* flies two periods ahead of the Ice Age, when horses were extremely numerous in the western hemisphere. Under the conditions accompanying the retreating glaciers, flies, mosquitoes, and ticks would have multiplied amazingly. Today cattle in South America are afflicted with many tick-borne diseases, especially anaplasmosis and prioplasmosis—the first accompanied by sharp blood reactions, the second by severe fevers.

We now do not have many tick-borne diseases affecting horses, but such have existed in the past. Dr. Eliot made a study of how ticks infest horses, and found that they accumulate in the mane. The horse's falling mane makes it more susceptible to gathering ticks while grazing than the erect mane of the ass or zebra. Eliot discovered that thousands of ticks could gather in a horse's mane during a single night's grazing. Whatever the cause of the extinction of horses in prehistoric America, it is fortunate that they could return to the Old World, and were available for domestication when man reached the proper stage of development. This return was more lucky than many realize, for horses had become extinct in Europe in the late Eocene or early part of the next period.

During the fourth period, or Pliocene, horse types began to differentiate into two kinds—browsing and grazing types. This demarcation was apparent also in camels, elephants, rhinoceroses, and many other herbivorous animals. The browsing types lived along streams in moist forests, swamps, and valleys, and consumed much coarser plants than the grazing types. Since their food was always more readily available, they did not have to travel the distances of the grazing types, and had heavier bones, coarser hide and hair, and rougher, cruder conformation. In this first separation appeared the beginning of the classification into cold-blooded and hot-blooded horses. One interesting horse of the browsing type, found in the western hemisphere during the early Ice Age, was a tall, heavy animal whose remains have been discovered in Texas, that stood nineteen to twenty hands at the withers. This horse seems to have flourished during a warm interglacial period. An important difference between the two types of horses was found in the teeth. The grazing type had longer, harder, faster growing teeth than the browsing type, which had short, relatively flat teeth, not as well supported by the growth of pillars on the corners.

Strangely enough, the first relations between man and the horse indicate that the latter was an article of food. Some of the drawings of the cavemen in France and Belgium present the horse as an object of the chase; one, interestingly enough, showing a drawing of a horse with its heart outlined at the proper place and pierced by a prehistoric hunter's arrow. Near Solutre in the Saone Valley in France, between the modern cities of Chalons and Lyons, remains have been found of an open-air camp where prehistoric tribesmen apparently met for hundreds of years. Around it are great walls of bones, apparently thrown from the hearths where they were cooked and eaten, until they formed an immense rampart that was later used for defensive purposes. Toussaint estimated that the bones of more than a hundred thousand horses are intermingled there with the bones of other species. Most of these bones were cracked and split, apparently to get at the marrow. Obviously the horses from which the bones came were the object of the chase, and not grown for food. If the latter had been true, remains of many younger horses would have been found, but instead the great majority came from animals five to seven years old, which had to be hunted to convert into food.

As we come into historic times, western Europe, especially in the lowlands of France, Holland, and Belgium, was supporting a heavy-boned browsing type of

horse. This was the ancestor of the great Flemish war horse which bore the knights to the tournaments and the distant Crusades, as well as gave rise to the modern draft breeds. Dr. Ewart of the University of Edinburgh has perhaps made the most careful study of the different strains that have led to the modern breeds, and points out certain interesting characteristics of the great browsing type that became the cart horse. In comparison with other horses he shows that it was relatively large and clumsy, that its face was broad and short, and that it carried straight out from the cranium. The limbs were short, the cannon bones stout, and they were only 5½ times as long as they were wide. The joints were large, and the feet spread enough to adapt the animal to wet marshy ground. Its coupling was relatively long, containing six vertebrae, and its tail was set low, with a drooping croup. In the pre-Roman period it stood about 13:2 to 14 hands high.

Its direct antithesis was the desert or plateau type ancestor of the hot-blooded breeds. It stood about 12:2 hands, and was small footed, slender limbed, and had cannon bones 7½ times as long as wide. It was shorter coupled than the browsing type, possessing only five vertebrae in the coupling, and was a better weight carrier, also shiftier on its feet. Most characteristic was its smaller, more beautiful head, with a fine slender face below large prominent eyes, set well apart. The face did not come out quite so straight from the cranium, and occasionally it was dished slightly between the eyes and below the eye orbits. Best known of this type was the Turk, Arab, and Barb, that fringed the eastern and southern Mediterranean, the thick-coated Celtic pony, and the forerunners of the English race horse.

Finally there was a third type intermediate between the foregoing—the steppe horse found wild in modern days in the Gobi Desert. It was unrelated to modern American breeds, and some authorities have assumed that this type was originally a forest horse, that had to readapt itself to drier conditions as its habitat rose in elevation.

When the Crusaders met the Saracens, they could not close with them in combat because their great horses, borne down with armor, could neither maneuver with, nor overtake the fleet-footed desert mounts. Many of the knights admired these horses they could not conquer, so much that they brought them back to Europe, and Arabian types eventually reached all countries of Europe. From the infusion of these bloods came the English Thoroughbred, the English, French, and German coach horses, the cavalry horses of all European armies, and the French postchaise horse that ultimately developed into the Percheron. Most important of all, in its effect on the American West, was the Spanish horse, invigorated and leavened by the gallant steeds introduced by the Moors, and left behind when the Christian forces drove them back to Africa.

The horse returned to the western hemisphere with Columbus on his second voyage. The decks of his ships carried horses and cattle, the horses side-lined or hobbled, as they could not have been controlled if turned loose. This practice was followed on later Spanish vessels, the horses remaining on deck in all kinds of weather. When the calms appeared along the edge of the trade-wind zone, and supplies of fresh water became short, it was often necessary to throw the horses overside. During the sixteenth and seventeenth centuries, the "horse latitudes" were frequently mentioned —here is how the name originated.

Columbus took his livestock to Hispaniola (modern Santo Domingo), and from there they spread to the rest of the West Indies—Jamaica, Porto Rico, Cuba, Trinidad, etc., and thence to the continent. Jose de Acosta, writing at the close of the sixteenth century, said that horses multiplied exceedingly in the Indies and "became most excellent," in some places "being even as good as the best in Spain." He said that they did fast messenger work, and were good both for war and the parade. They spread all over the plains of South America, covering Patagonia by 1650. They were not introduced to the pampas until 1535, when Pedro Mendoza released five mares and seven stallions on abandoning the first settlement at Buenos Aires. By 1600 Guzman says their progeny was so numerous that they could not be counted, and that they appeared in great droves that even penetrated into the Cordillera mountains. By 1557 even the poorest *Gaucho* owned horses, and they were worth about two dollars apiece.

Horses came to the North American continent with Cortes in 1519. Full description of each of his sixteen animals has been preserved, as well as of the twenty others, which Alvarado brought to Vera Cruz to participate in the conquest. The first expedition to Florida included a hundred horses and mares, while Coronado brought a thousand horses and six hundred pack animals to the southwestern part of the United States in 1540. The horses on which the population of our Southwest was based, however, were brought by Onate in 1598. It was nearly two centuries after that when Spanish horses reached California.

Just what were these Spanish horses? They had been vastly improved during Moorish invasion of the Middle Ages, and were quite largely Barbs in descent. Denhardt describes them as of the same build as the horses in the famous painting of Velasquez, short-backed, close to the ground, and admirably suited to the hard work of a campaign. Their legs were not too long, and were firmly jointed, indicating that they were sure on their feet. Their pasterns were long, which produced a springy gait, and they became a race capable of unbelievable feats of endurance.

These Spanish "thunderbolts," as Jack Thorp calls them, became the foundation of the cow horse in the western cattle industry. Readily they turned on a dime and flashed at top speed at the flick of the spur. Father Kino used them in his numerous explorations along the Arizona-Sonora border and, when he crossed westward

from Yuma to discover whether Lower California was an island or a peninsula, he took with him only a few Indians, but 130 saddle horses and mules. Anyone who has travelled that country knows why he needed so large a *remuda,* but still admires the horses for being able to complete the necessary performance. Father Kino was a horseman! When fifty-one years old he rode from his Dolores mission near the Arizona border to Mexico City, fifteen hundred miles in fifty-one days, with almost daily stops for weddings, baptisms, funerals, masses, and other services. Two centuries later a young lieutenant in the Mexican Army, Don Elfrego Morales, rode two hundred miles in twenty-five hours on one of those "thunderbolts" in a thoroughly authenticated trip from Chihuahua to Juarez. Yet these horses weighed only 750 to 800 pounds and stood 14 to 14:2 hands.

The greatest endurance ride in history is credited to a string of these horses, and Francis X. Aubrey, "one rider in a million." It was approximately eight hundred miles along the Old Santa Fe Trail from Santa Fe to Independence, Missouri, and between December, 1847, and September, 1848, he made three fast trips back to Independence after taking out a wagon train of traders' goods, each of which broke all previous records. First he left Santa Fe with five men on December 22, 1847, but the other five dropped by the wayside, and he arrived alone in Independence, January 5, 1848—fourteen days en route, and ten and a half days faster than any previous record. Taking another wagon train to Santa Fe earlier in the season and more rapidly than ever before, he started back with six men from Santa Fe on May 19. His companions broke down from exhaustion before they had travelled three hundred miles. He was attacked by Indians, and he killed three horses and two mules by hard riding, walked between thirty and forty miles, and went three days without provisions. But he rode into Independence on May 27, eight days and ten hours after leaving Santa Fe. On August 8, 1848, the *Santa Fe Republican* said of him: "That gentleman travels with a rapidity almost supernatural."

Then came the supreme exploit. Disgusted with the frailties of his fellows, he planned this trip alone, and carried as proof of his departure date, a letter from the *Santa Fe Republican* "for the benefit of its exchanges in the states." On September 12, he left Santa Fe before dawn, at a swinging gallop, crossed Glorietta Pass, and raced down the mountain slopes toward the Great Plains. Bieber writes: "Dashing eastward at a terrific pace, he obtained fresh horses from passing wagon trains, and at Fort Mann, Council Grove, and other places where he had stationed them. A yellow mare named 'Dolly,' his favorite mount, carried him two hundred miles in twenty-six hours." Dolly was the ideal Spanish Palomino, not the parade, but the trail type. For nearly six hundred miles the trail was muddy, and for one hundred miles he rode through a driving rain. He broke down six horses, walked twenty miles, slept only a few hours, ate but six meals, and swam many swollen streams, but on Sunday night, September 17, "his foaming horse half ran, half staggered," into Independence. The trip was completed in five days and sixteen hours, at an average rate over plains and mountains of 140 miles per day. Alexander Majors, the great freighter and teamster of the West in prerailroad days said of Aubrey: "The man who attempted to ride eight hundred miles in the time he did took his life in his hands. There is perhaps not one man in a million who could have lived to finish such a journey." And the key figure in the ride as far as the record was concerned, was the yellow "thunderbolt" Dolly, who by herself covered twenty-five per cent of the distance in nineteen per cent of the time.

Crowning incident in this record of the horse of Spanish extraction is the battle of San Pasqual, between General Stephen Kearny's dragoons, and the Californians mounted on Spanish horses. On September 25, 1846, General Kearny left Santa Fe for San Diego with a force of a hundred officers and men, his dragoons mounted on mules which were expected to withstand the southwestern deserts better than army horses. By early December they learned that the Californians were revolting against the new government set up by Colonel Fremont and Commodore Stockton, and that eighty (or a hundred fifty according to another report) of them under command of Captain Andres Pico, brother of the Mexican governor of California, were awaiting the dragoons on the San Diego road at San Pasqual *rancho.* Kearny ordered a daybreak attack, and sent twelve dragoons under Captain Johnston, with Kit Carson as guide, as the advance party, followed by himself with certain other officers, and then the main body of fifty dragoons, with two howitzers following them and preceding the wagon train. Kearny's horses and mules alike were worn with their eight-hundred-mile march across the desert, but would have been small match for the *Californios'* horses even when fresh. The ensuing battle was one-sided, just as in the days of the Crusaders and Saracens. According to Sabin, Pico's men were "free Californians to whom the saddle was home, the horse a second self, the stirrups, lance, and *reata,* their manly exercise. At first alarm, and well before the (American) charge struck the village, they had vaulted with their arms into the saddle. They recoiled on rearing horses to take stock; at Pico's sharp command they stood fast—there were only some twenty Americans, tearing in, with shouts and jingles and random pistol shots and flourished sabers, like fools—and holding their ground they received the charge with a volley." Then with cries of "Viva California," they breasted the shock, with their lances poised.

The American forces opened up over a half mile in length, because of the difference in speed of their horses and mules, and the *Californios* were able to outdistance each group individually and defeat them in detail. The nine-foot lances, wielded from horses under perfect command, were too much for sabers and clubbed

muskets or rifles, swung from fagged and stubborn animals. General Kearny was lanced in three spots, while all officers and all but two or three of the enlisted men were wounded. When the howitzers were unlimbered, the mules drawing them were lassoed, the cannoneers lanced, and one howitzer was dragged into the California ranks. For the course of American history it is well that the *Californios* could not discover how to operate it. When the Americans could go no farther, Carson, Midshipman Edward Fitzgerald Beale of the Navy and Beale's Indian servant managed to escape to San Diego and bring relief. Had it not been for Commodore Stockton's naval base, the entire trend of Pacific States development might have been changed by those Spanish "thunderbolts."

The number of wild horses that descended from these Spanish horses, which escaped from their owners, will never be known. Between the Missouri River and the Pacific, they grazed all the plains and valleys, and probably totalled in the millions. At the rate they were multiplying when the cattlemen took over the western range, it would appear that only white intervention prevented them from equalling, or even driving out, the buffalo. When Zebulon M. Pike went into Mexico in 1806, he reported that it was necessary to keep an advance guard of horsemen to frighten them off, for otherwise their own animals would run off and then join the wild bands. A Mexican gentleman told Pike that he saw 700 horses carried off by a wild band at one time, and that none of them were ever recovered. These mustangs were both a nuisance and a menace. They drank precious water in a country that was always in need of it, and they consumed the range grass needed for profitable livestock—few mustangs were worth over ten to fifteen dollars when broken, and their spirit was so high that three out of four died in the breaking. The mustang was not the cowboy's idea of a horse for all of its activity and fire. It was too small, too long bodied, and too unresponsive when broken. The cowboy's bronco came from domestic descendants of the Spanish horse, not the mustang.

But the mustang made the Indian. When they first saw it with Cortes they thought it was supernatural, but when they killed one and cut it up, a few decided it was mortal. Enough conservatives existed, however, to play safe by giving the horse's shoes to their gods, for obviously the horse's shoe seemed immortal even after the horse's death. No one knows when the Indian's first fear of the horse was overcome, but it was probably when he learned that an arrow could kill a horse, or its rider, or both. After the missions were established, with their accompanying *ranchos*, the Indian herdsmen became thoroughly familiar with them, and it was probably the backsliders from the missions who taught others in their tribe how the horse should be handled. Strange to say it was not the tribe who used the horse under guidance from the missionaries that became most adept in its use, but instead the more northern tribes, who were largely regarded as renegades. From the Spanish settlements, the horses were stolen in big raids, and then passed on to the tribes beyond. The great distributors were the Comanches, who finally came to believe that the Great Spirit made the horse for them, and that they gave it to the white man, though the Spanish brands on their stolen horses refuted their claim. However, horses moved northward in Indian bands faster up the west side of the Rockies than on the east side, and many of the northern Indian tribes got their animals from the Shoshonis west of, or on, the Continental Divide, rather than from the south. The great cavalry tribes were the Comanches, Arapahoes, Pawnees, Cheyennes, and Sioux, although many others were quite expert.

The coming of the horse to the Indian was as important as the coming of steam to the white man. The Plains Indians had never been agricultural, but the horse intensified their nomadic and warlike traits so that they became the "greatest raiders and most splendid thieves on earth." The ability of the Indian to throw himself from an upright position on the back of his horse to its side, and from there throw spears, or discharge arrows, under the horse's neck, has never been equalled by any other race. The Indian always mounted his horse from the off side, claiming that it was more natural that way. Since they usually vaulted from the ground to mount, there is some justice to the claim. The arrival of the horse led the Plains Indian to abandon most forms of agriculture, and turn to living on the buffalo more than ever before. With the horse they roamed for miles, trespassed on each other's hunting grounds, went to war, and otherwise became the marauders of the Plains. When a whole camp could be moved quickly with the pony to transport the tribe, to serve as a packhorse, and to draw the uncomfortable travois, there was little time left at a camp site to wait for crops to grow.

The horse became the measure of wealth in the Indian economy. The man with the best horses got the most buffalo and was the best equipped warrior. With them he could buy his wives and pay his debts. His wealth and social position was determined by the number of ponies he owned, and a chief had to own more than any other member of his tribe. Buffalo hunting, horse stealing, and raids on other tribes became the chief sports when the horse culture was at its peak. One old chief told Captain Marcy that his four sons were of the greatest comfort to him because they each could steal more horses than any other member of the tribe. We may not regard the Indians' horse culture as moral, but it was certainly mobile.

In closing I turn to the eastern colonies with a certain degree of embarrassment, for I realize that all of you are more familiar with that phase of our equine history than any other. The first horses to affect our present situation permanently came to Jamestown in 1609, and thereafter appeared with each new colony that was

planted. English and Dutch horses affected our early stock horses most, although some French horses were introduced from Canada via New England, upper New York and, later, the Mississippi Valley. However, the French relied on the canoe and water for transportation, and then left the country much as they found it, just as did the Indian. The English, Dutch, German, and Swedish colonists depended on horses and highways, and their progress could be traced by the advancing turnpikes and the great national trails. While the Cavaliers brought Thoroughbreds to Virginia and promoted racing, the real story of the horse in the east was a story of his services. The earliest settlers along riverbank and salt bayside had easy and comparatively quick transportation, but succeeding generations followed up the river valleys, clearing the hillsides of forest and boulder, opening new farms, and building new homes. Away from the watercourses, transportation became a problem, and the horse had to perform duties for which none of the specialized English types were well adapted. Going to the mill was a day's journey, and going to church often involved several hours over trails where vehicles could not move. The horse had to be part mount, part pack animal, and part draft. The year's trading was done during the winter at the nearest tidewater town, when stone and stump were buried under several feet of snow. The family horse would carry his master, and perhaps his mistress, on his back, and draw a homemade sled loaded with pork, beans, potatoes, and other produce to barter for salt fish, tea, tobacco, and West Indian goods—sugar, molasses, and rum, for those who are inquisitive. The colonists, especially in New England, were a tireless people, with iron wills, rugged constitutions, and muscles like tempered steel—always on edge. It took a horse to match this to serve the native needs, even at courting time. When harvest moon tempted the youthful swain to a quilting party or a husking bee, it required a quick eye, a strong arm, and a steady steed to bear his sweetheart in safety through the forest, past boulder, across torrents—perched high upon a pillion, or less commonly, a side-saddle. The horse of the early colonies, Maryland, Virginia, and Carolina excepted, was kept for service and not for sport.

This did not mean a placid horse. Out of such scenes the Morgan sprung—handsome, courageous, intelligent, sensible, fast, and tough, but nervous and spirited just like the Spanish thunderbolts to which we have just referred. The Morgan was the first American breed, sprung from a colt that drew the name of his master, Justin Morgan, a Vermont schoolteacher. He was sired by a horse called True Briton or Beautiful Bay—captured from an uncompromising Royalist and renamed Beautiful Bay in the revulsion from things British that came after the Revolutionary War. To a patriot anything named True Briton was perforce a traitor. Beautiful Bay was probably a Thoroughbred, although many will argue the question, but when Justin Morgan went to Randolph, Vermont, his court was composed of mares of good old Dutch blood, mostly introduced from New York. These mares were fifteen hands or under, compact, tight built, on the order of the Barb and Arab, though lacking a little of the fire and spirit.

As the highways spread and improved, the need for harness horses—roadsters—was born. And the cross was much the same, medium sized stallions with medium sized mares. Hambletonian 10, a Thoroughbred, George Wilkes, Abdallah, Electioneer, all were horses not far from fifteen hands in height that could stretch their legs in a trot. And when the pacer was wanted, another version of the Dutch mare in build, if not in blood, appeared, the Narragansett pacer from southern New England. Perhaps back on the mare's side in the pedigrees of the American Saddle Horse, some of this broken gaited strain appeared, although the Thoroughbred again came in on the sire's side. Even in the newly revived Quarter Horse the type has come through, though the bloodlines differ. Copperbottoms, Steeldusts, Peter McCues, all alike hold to the same generalized type that have been basic to American breeds.

A century ago, as farm machinery developed, greater power was needed under the control of a single man on the farm. In the period that followed the Civil War and through World War I this led to an increasing insistence on size in work horses, and a pronounced boom for the imported draft breeds. But during the last quarter century the requirement has been for even greater power, concentrated in the hands of one farm worker, and the draft horse has become gradually displaced by mechanical devices. It looks to be the same story over again that has been told so many times in the course of evolution—the overspecialized animals fall by the wayside when conditions get so strenuous that they can no longer meet the challenge.

Each time we have had to meet a new want in America that the horse could fill, except for heavy draft, we have gone back to this versatile type as a starting point—the western cow horse, the roadster, the Morgan, the gaited saddler, the Palomino of today, and the Quarter Horse. The answer has been found each time in some combination of this generalized type of horse and the Thoroughbred. Now it would appear that all horses, except pleasure types, are to meet the challenge to which the draft horse is succumbing. This is far from a pleasant thought to anyone who has thrilled to the partnership of a good horse working with him and for him, or who has enjoyed the fellowship and companionship that develops between master and mount. We cannot turn back the hands of the time clock, nor would we if we could, but we can urge, with Colonel Mattick on this program two months ago, that no action be taken that will deprive America, and the Army as a constructive market, of the animal that has moved with it into world leadership. We must strive continually, as horse lovers, to preserve that quality and excellence in the horse which we all demand.

# SAVING THE CUSTER MUSTER ROLLS*

*by Edward G. Campbell***

ON June 25, 1876, Brevet Major General George A. Custer, lieutenant colonel of the 7th Cavalry, led Companies C, E, F, I, and L of that regiment against Sitting Bull's encampment on the Little Big Horn. Under the command of Chief Gall the Indians wiped out the detachment and left the bodies of 201 soldiers and 3 accompanying civilians on the battlefield. Two days later the bodies were covered with six inches of dirt by surviving members of another detachment of the 7th Cavalry under Major Marcus A. Reno that had barely escaped the same fate in a battle of its own and that had been utterly helpless to come to the aid of Custer and his men. More than a year later a detachment under Colonel F. M. Buel, which was sent to build Fort Custer on the site of the battlefield, found the soldiers still lying where they had fallen. Colonel Buel had an excavation made and the bodies buried in the one common grave over which the Custer monument was later erected. By September of 1877 this last chapter in the story of the Battle of the Little Big Horn had been finished.

As commander of the 3d Cavalry Division during the last months of the Civil War, Custer had boasted that his men "never lost a gun—never lost a color—and have never been defeated," but he more than met his match in the wily Chief Gall. Gall concentrated overwhelming numbers against the handful of men under Custer and so deployed his tribesmen as to block completely all avenues of retreat or reinforcement. But the tactical methods by which Gall achieved his victory, however brilliant, and the mistakes on the part of Custer, however disastrous, could never in themselves have achieved for this Indian battle the fame it has had and still has. It was the battle's dramatic denouement—complete and sudden annihilation—that made it a byword among people who had seldom paid much attention to Indian skirmishes once immediate danger had been averted.

The story of Custer's last stand has been told innumerable times during the past seven decades but apparently its hold on the American people has not yet weakened for in 1945 it was discovered that the muster rolls of the 7th Cavalry had nearly been destroyed by the constant use to which they had been put by government officials, students, the merely curious, and those claiming more or less close relationship to the men who died on the Little Big Horn. These records had been maintained for more than sixty-five years by The Adjutant General's Office of the War Department. Three years ago they were transferred to the custody of the Archivist of the United States, who is now responsible for their physical preservation.

The muster roll of Company F for the period including the Battle of the Little Big Horn, from April 30 through June 30, 1876, is a fair example of the rolls of all the ill-fated companies. The document itself measures 20 by 23 inches and for nearly seventy years it had been filed folded—folded four times—in order to reduce it to approximately 4 by 10 inches. Over the years constant use of the document had worn away those parts of it that had thus been made into hinges; in addition one corner of the roll had been torn off and lost—the corner including the signatures of the reporting officers. Exposure to dust and varying degrees of humidity had made the paper brittle so that fragments crackled into dust whenever the paper was handled, no matter how great the care in touching it. Obviously, unless something were done this particular Custer muster roll would soon disappear entirely, destroyed by use and time.

The information on the document is simple but it was of the utmost importance in the administration of the army. On one side at the top is pertinent information as to the company and period of time covered by the roll. Below this and on most of the obverse side the roll is divided into fifteen columns that show the rank and name of each individual in the company, when and where he enlisted, when and where he was last paid, whether clothing and tobacco allowances had been paid, the individual's signature, and remarks. The names of the twenty-eight individuals present are listed first, according to rank; the first name in this list is that of a second lieutenant newly appointed to command the company by special orders on the day following the Battle of the Little Big Horn. Then are listed "Loss—Killed in Battle," also by rank. The first name in this latter group is that of Captain George N. Yates; the last is that of Private George Warren, the thirty-eighth name in the list. Below these names appears a third group, "Loss—Transferred," under which is the name of one private who, by virtue of special orders dated April 30, 1876, was not with his former comrades on the Little Big Horn. In the place where

*Military Affairs.

**Director of the War Records Office, National Archives.

normally the thirty-eight killed on the Little Big Horn would have signed their names appears in red ink the notation, "Killed in Battle with Hostile Indians on the Little Big Horn River June 25, 1876."

At the bottom of the obverse side of the report on the left is a statistical analysis of Company F's strength, showing that, as compared to an average strength of 70 men reported in the prior muster roll, there were now 34 men present and absent and that 37 (*sic*) men had been killed during the period of the report and one transferred to another organization. In the middle of the sheet, under the heading "Record of Events," there is the statement of the company's history during the two months under consideration:

"Since last muster performed camp duties near Fort A. Lincoln from 1st to 17th May 1876. On that day marched, under command of Genl. Terry from Ft. A. Lincoln D. T. against Hostile Sioux Indians. Participated in Battle of Little Big Horn River M. T. June 25th and 26th. Lost 2 Officers 36 men and 42 Horses.

"Distance marched 688."

To the right of this statement is the signature of the reporting officer (whose name has been torn off and lost during the intervening years) and the date "In the field, June 30, 1876." Five days after the massacre there seemed no need to make more than this terse factual report.

The muster roll of Company F does not materially differ from those of Companies C, E, I, and L; the names and figures are different but not the essential pattern. And this pattern and the events lying behind it have been of such interest to the American people that in the seventy years since June 25, 1876, these documents were nearly destroyed by use. Rather than see archival materials of such proven interest lost the Archivist of the United States directed that they be repaired and that steps be taken to ensure that they should not again be threatened with total destruction.

The Little Big Horn muster rolls—those covering the period of the battle—were so filed in relation to others that it would have been impossible to repair them and to ensure their future preservation without also providing for the other rolls of the same regiment from 1860 to 1912. The later rolls were not in such bad condition as were those relating to the summer of 1876 and earlier years but the only practical method of ensuring the proper protection of the body of materials was to deal with all these rolls alike.

A total of fifteen cubic feet of paper, consisting of 21,102 sheets of paper, was therefore removed from the fifty-one Woodruff-type file boxes in which the rolls had rested for nearly seventy years, and each individual sheet was flattened, care being taken to prevent separation of fragments of the same sheet. About seventy-eight sheets could be flattened by a repairman in an hour, so that it took about thirty-five working days, working eight hours a day, just to flatten the muster rolls. Next it was necessary to "laminate" each sheet that was in very poor condition, that is, to enclose it between two sheets of transparent cellulose-acetate foil and apply heat and pressure until the foil melted into the document, while making sure that each fragment was in proper juxtaposition to each other fragment of the same sheet. Only the earlier rolls required lamination but they were in very bad shape; in the past scotch cellulose tape and similar gummed materials had been used to keep fragments from being lost and these materials—useful though they had momentarily been—had over a period of time contributed to weakening the fiber of the paper. All such materials were removed before the cellulose coat was applied to the rolls; as a consequence one man could laminate only four or five sheets in an hour. About 1,600 sheets had to be laminated so it took more than sixty days to complete this part of the job.

Even after the muster rolls had been flattened and those that needed it had been laminated, however, the possibility of deterioration occurring again had not been precluded. If the rolls were again folded and filed as heretofore the creases would probably wear through and the documents would fall into fragments. There was only one sure way to prevent that happening, namely, not to fold the documents again. But documents of this size, if kept flat as loose sheets in drawers, have a way of getting lost, and constant "pawing" through them in search of one that is wanted will cause more deterioration than almost any other conditions of use. There was only one answer: stitching into folios protected by stiff covers. The documents that had been laminated had been provided with binding margins prior to lamination by enclosing in the cellulose-acetate envelope a strip of cloth that extended about an inch beyond the edge of the paper on the binding edge. The rolls thus treated—all the older documents—were first stitched together in folios, including in each folio the muster rolls of a given company or other unit for a specified period of years, and then a stiff cover was affixed by gluing to the stitched binding margins. The muster rolls for the later period, approximately 1885-1912, which had not required lamination, had an adequate binding edge and they were sent to the Government Printing Office for binding into thirty-nine separate volumes.

The repair of the Custer muster rolls was not accomplished in a day nor was it done without a considerable expenditure of money but the rolls were returned to their shelves in the National Archives in excellent condition—probably in better condition to survive the rigors of continued use than they had been on the day they were filed in the War Department. The rolls will now be available so that later generations interested in Custer's Last Stand may examine their official and terse story of June 25, 1876, just as it was written that summer and as it has been seen by countless interested persons in the years that have already intervened.

* * *

# Armored Division Associations

**Addresses of Armored Associations**

1ST ARMD DIV.

Colonel C. C. Benson
World War I Branch
Bldg. 21-A, Army War College
Washington 25, D. C.

2ND ARMD DIV.

Captain George M. Warren
2nd Armored Division Association
Headquarters 2nd Armored Division
Camp Hood, Texas

3RD ARMD DIV.

Colonel L. L. Doan
3rd Armored Division Association
GNDEV Section, Bldg. 134, Rm 201
Hq. Army Ground Forces
Fort Monroe, Virginia

4TH ARMD DIV.

Lt. Col. Creighton W. Abrams
4th Armored Division Association
Fort Knox, Kentucky

5TH ARMY DIV.

Lt. Col. F. E. Ressegieu
5th Armored Division Association
Room 4C839, The Pentagon
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6TH ARMD DIV.

Colonel George W. Read, Jr.
6th Armored Division Association
Army Ground Forces Board No. 2
Fort Knox, Kentucky

7TH ARMD DIV.

Chaplain James Fahl
7th Armored Division Association
2517 Connecticut Avenue, N.W.
Washington 8, D. C.

8TH ARMD DIV.

Colonel E. R. White
8th Armored Division Association
c/o Extension Course Department
TAS—Fort Knox, Kentucky
and
Brig. General John M. Devine
8th Armored Division Association
Fort Knox, Kentucky

9TH ARMD DIV.

Captain Louis Gelling
9th Armored Division Association
Fort Knox, Kentucky

10TH ARMD DIV.

Major Harry W. Johnson, Temp. Sec.
10th Armored Division Association
General Delivery
Fort Knox, Kentucky

11TH ARMD DIV.

Colonel Willard A. Holbrook
11th Armored Division Association
1719 "K" Street, N.W.
Washington 6, D. C.

12TH ARMD DIV.

Mr. J. Edward Obey
12th Armored Division Association
419th West 38th Street
New York, N. Y.

13TH ARMD DIV.

Major General John B. Wogan, Rtd.
13th Armored Division Association
Cherry Lane, Lakeview Park
Asheville, North Carolina

14TH ARMD DIV.

Lt. Colonel J. C. Lambert
14th Armored Division Association
Hq. Adjutant Generals School
Carlisle Barracks, Pa.

16TH ARMD DIV.

MacArthur H. Manchester, Sec.
16th Armored Division Association
2517 Connecticut Avenue, N.W.
Washington, D. C.

20TH ARMD DIV.

Mr. Kris K. Gilbertson
20th Armored Division Association
c/o Rhinelander Daily News
Rhinelander, Wisconsin

*CAVALRY DIVISIONS*

1ST CAV. DIV.

Colonel Edmund P. Stone, Registrar
1st Cavalry Division Association
P. O. Box 201
Pomona, California

5TH U.S. CAVALRY

A. B. Haid, Vice Commander
5th U. S. Cavalry Association
Fountain Hill Hotel
New Castle, Pa.

6TH U.S. CAVALRY

W. R. Wagner, Adjutant
6th U. S. Cavalry Association
4476 Beniteau Avenue
Detroit 13, Michigan

* * *

### 1st Armored Division

The Washington Branch of the 1st Armored Division Historical Association commenced its organization on May 8, 1947. Its object, as stated in the Articles of Association, shall be:

"To perpetuate and preserve the memory and renown of the 1st Armored Division, U. S. Army.

"To promote the welfare and interests of former members of the Division, particularly those disabled in service; and to extend such aid as is practicable to the families of 1st Armored Division personnel who were killed in action.

"To facilitate the preparation and publication of a history of the 1st Armored Division, and to help carry out all other purposes for which the 1st Armored Division Historical Association was created.

"To assist in the formation of other branches of the 1st Armored Division Historical Association."

Membership is open to any person who has served honorably as a member of the armed forces of the United States, and who has been assigned, or attached for duty, in or with the 1st Armored Division at any time from the date of its organization, 15 July 1940, to the date when its last unit was inactivated, or redesignated for Constabulary service in Germany, in 1946. Any interested person not meeting these qualifications is eligible for associate membership.

The Washington Branch desires to affiliate itself with the 1st Armored Regiment Association, the 13th Armored Regiment Association, the 91st Field Artillery Association, the 701st Tank Destroyer Association and all other branches of the 1st Armored Division Historical Association as may have been, or may be, formed, in order to expedite and facilitate the active formation of the national association. To this end, the Washington Branch solicits suggestions and information regarding the other branches and individuals desiring to join in furthering this worthy cause.

At a recent election, the following were named officers of the Washington Branch:

| | |
|---|---|
| President | Peter C. Hains, 3rd |
| Vice President | Robert Linvill |
| Secretary | Frank B. Clay |
| Treasurer | Jack Gleason |

The Washington Branch of the 1st Armored Division Historical Association has appointed Colonel Chauncy C. Benson as its Chief Historian. Colonel Benson joined the 13th Cavalry as a Second Lieutenant just out of West Point in 1914; and 29 years later, commanded that regiment in the Tunisian Campaign. He is now Chief of World War I Branch, Historical Division, War Department Special Staff.

The 1st Armored Division Historical Association plans to sponsor the preparation and publication of historical works as follows:

Bivouacs and Battlefields, North Africa, American 1st Armored Division, World War II. Pictorial, with sketch maps and a limited amount of written material.

Bivouacs and Battlefields, Italy, American 1st Armored Division, World War II. Pictorial, with sketch maps and a limited amount of written material.

Unit Histories—One for each regiment and separate battalion of the 1st Armored Division, including the 701st Tank Destroyer Battalion; one for each combat command and the 1st Armored Division as a whole; each with appropriate photographs and sketch maps. Each of these unit histories will include data on the unit concerned from the time it was first organized to the end of 1947; but will be strictly limited to concise factual statements, on which unit historians may elaborate as they see fit for particular operations.

The historical work outlined above constitutes an ambitious program which will require strong financial support. The 1st Armored Division Historical Association has sufficient funds on hand to pay for the work involved in the preparation of these publications; must rely on their sale to pay the costs of printing, binding and distribution. The pictorial volumes devoted to battlefields in North Africa and Italy will have wide appeal, not only to former members of the 1st Armored Division, but also to members of all other units that fought on those fields. When the books are ready for publication, orders will be solicited.

* * *

### 3rd Armored Division

The Third Armored Division Association home office is sponsoring a series of get-together dinners for Spearheaders located in large population centers. Detroit, Chicago, and Fort Knox have already had successful meetings. An all-New England dinner and a New York dinner will be held in July.

During July, post cards were sent to all members of the Association, on which the members will vote for the time and place to hold their first national convention. In the meantime, the drive for new members is continuing. Any former Spearheaders who are not yet members of the Association should send in for an application blank. The address is: P.O. Box 66, Fort Monroe, Virginia.

Officers of the Chicago chapter were elected at the mid-April dinner. They are: Arthur J. Rutshaw, president; Charles O'Brien, vice president; E. Brantner Williams, secretary; Art Gillis, treasurer; and Charles Kalnis, director of publicity.

Former members of Service Company of the 32nd AR plan to hold their second annual reunion in Detroit during the second week in August. To date 40 members have indicated their intention of attending the reunion.

General Orders No. 31, Headquarters, European Command, dated April 24, 1947, designate the Hof Kaserne located at Hof, Germany as Maurice Rose Barracks in honor of the late Major General Maurice Rose. General Rose led the Third Armored Division across Europe during the past war. He was killed in action March 30, 1945, while with the forward elements of his division on an attack in Germany.

### 5th Armored Division

The local chapter in Chicago is making all arrangements for this year's convention in that city on the 28th and 29th of August. The convention will be held at the Congress Hotel and, even at this rather early date, promises to be well attended.

General Oliver has found it necessary to go overseas for an indefinite period but promises to make it back in time for the convention.

Local chapters are being organized at various places in the United States, including Los Angeles, Chicago, St. Louis, Fargo, Topeka, Minneapolis. One has been proposed for Paris by Vicomte Pierre de Douville-Maillefeu (ex-81st Tank Battalion), who points out that there are a number of French who fought with us as well as a few American soldiers and civilians in the vicinity.

The first annual reunion of the Fifth Armored Division is definitely set for August 28th and 29th at the Congress Hotel in Chicago. A local committee from the Chicago Chapter of the Association is running the convention and promises a big time for all who can attend.

General Oliver is now in Turkey on a special mission for the War Department but states that he will be in Chicago for the convention if it takes a special flight from the Middle East.

The Division Association has secured from various manufacturers samples of lapel pins, license plate markers, gold finger rings, etc., containing the Fifth Armored Division insignia and is offering these for resale to former Division men.

Ferd Nauheim, formerly of the 10th Tank Battalion and now a resident of Washington, D. C., has been announced as one of two Americans among six former servicemen to win $1,000 in the United Service Book Contest. Nauheim wrote a novel entitled *Behold the Upright*, which deals with a German family and an American tank battalion. He states that the background and much of the action of the novel are taken from actual experiences of the Fifth Armored Division during its combat in Europe. Publication of the novel has not yet been undertaken.

Local chapters of the Division Association are being established in Los Angeles, St. Louis, Minneapolis, Chicago, Omaha, New York City, Fargo, Toledo, Jersey City, and Wichita.

Major E. F. Hurley, formerly of the 15th Infantry Battalion, will arrive in Washington during July, to be assigned to the Historical Division of the War Department, and will write a new and complete history of the Fifth Armored Division from the time of its activation until its inactivation.

Information concerning the Fifth Armored Division Association and its activities can be secured by writing to the Secretary at 1719 K Street, N.W., Washington 6, D. C.

### 6th Armored Division

The Sixth Armored Division Association is now in process of formation under the supervision of Colonel George W. Read, Jr., with temporary headquarters located at Fort Knox, Kentucky, where the Division was activated on 15 February 1942.

All those who served honorably in the Division between the activation date and V.E. Day, 8 May 1945 are eligible for membership and may secure application blanks by writing to The Secretary-Treasurer, Sixth Armored Division Association, Fort Knox, Kentucky.

The Sixth Armored Division will long be remembered for its outstanding exploits in World War II. In more than nine months of combat the Division, in whole or in part, was continuously in action in the European Theatre until the end of the war with Germany, except for a period of less than two weeks. From the hedgerows of Brittany through the forest gorges of the Ardennes and the flooded bottoms of Lorraine, to the rolling hills of Saxony, the Division mastered every variety of terrain and every type of combat. In the combat history of the Division there is no account of failure and the record was closed with the report, "Mission Accomplished."

The purpose of the Association is to perpetuate the memory of our fallen comrades; perpetuate the renown of the Sixth Armored Division; preserve the "Esprit de Corps"; assist in the promotion of an everlasting peace; and to serve as a medium of contact among and to promote the welfare and interest of those who served in the Division.

The first annual reunion of the Association is tentatively set for the spring of 1948. At that time the permanent officers will be elected and decisions reached as to the future plans of operation.

Some 10,000 application blanks are now being mailed to former Division members whose addresses have been secured, and an enthusiastic response is expected.

### 7th Armored Division

A major change has recently taken place in the 7th Armored Division Association with the resignation of Joe Reddy as General Manager. Starting in June of 1946 with a nucleus of men from the 48th Infantry, Joe rendered invaluable service to the Association by organizing the work and by carefully nurturing the enrollment. By the time of his resignation in May of this year, the Association had grown to 500 members, largely by dint of Joe's persistence, in the absence of Division rosters. In his capacity as General Manager, Joe did the combined work of both Secretary and Treasurer.

With Reddy's resignation, the National Headquarters has been moved from Libertyville, Illinois to Washington, D. C. A temporary committee has been formed to take over the operation of the Association until such a time as the Association reaches a state of organization and size sufficient to hold national elections. At present, Jim Fahl, former Chaplain with CCB, is Secretary of the Association; Judge John P. Oliver, former JA, is General Manager and Legal Adviser; and Bill Knowlton, formerly of B Troop of the 87th Reconnaissance, is Treasurer. After a month's delay due to the transmission of records and checking of the charter and former minutes, as well as to the administrative setting up of the machinery for handling new members on a larger scale, the Association is ready to commence operations again, with emphasis on enlarging the membership and establishing a degree of decentralization with local chapters. Communications should be addressed to Seventh Armored Division Association, 2517 Connecticut Avenue, N.W., Washington 8, D. C.

At present, plans are to send out to all members a news sheet telling of the change in address and headquarters, as well as a roster with the names and addresses of all members. It is hoped that in this way, present members will be able better to contact each other in the setting up of local organizations. Rosters with names and addresses of former members of the Division are badly needed in this activity, and should be forwarded to the Association at the address above.

### 11th Armored Division

We want all of you to know the response to our "third and last notice" post card sent out to all unpaid members the first week of June has brought us amazing and most gratifying results. Close to 1,000 members sent in their dues with the post card and we have also received about 28 history payments of $5.00 each which have been acknowledged and credited to the individuals.

Some of you members received the "third notice" without hearing anything from the Association before that—and the reason for this is that so many "lists" and individual names were coming in to us daily, we could not stop to check each and every one of them to see if it was already on file. We took the easiest and quickest way out—that of mailing the card to you for your immediate reply, so you would receive information on the history, convention, etc., before it was too late for you to make arrangements to attend the convention. Many of you received more than one card because as we explained, we had many duplications of names—many with a slight difference in spelling, a different address, or the same name but a different "unit." Your prompt reply and return of the card helped us "clean house" on many of these duplications in our files. Some of you were a little "peeved" about getting more than one card, but on the whole, you were very good sports about it and gave us credit for trying anyway.

Another point we wish to clarify, is that many of the members returned our card, stating that "dues were paid in Austria." We should have told you that all payments received in Austria had been duly credited to the individuals but that this is another appeal for funds for the current year, with which to run the Headquarters in Washington, help with the mailings of the local chapters, mailings to members, printing of Newsletters and membership cards and other expenses incidental to maintaining a headquarters for the Association.

Any of you who received the "third" notice with the June 20th deadline, who have not as yet paid your membership dues and DO WANT TO JOIN THE ASSOCIATION, send the card back to us with your $1.00 and we will be glad to have you and will see that you receive full information on the convention and Association. The reason for the June 20th deadline was, as we said before, so that those of you who were interested in attending the convention, would receive the information in time to make the necessary arrangements to attend.

In a letter from Bill Lipp of Chicago, who is in charge of handling the hotel reservations and registration fees, he states that well over 200 members had registered by June 1st, with about 60 of that number bringing their wives. The number planning to attend is undoubtedly higher by this time, especially if all of you who wrote us of your interest—followed through in sending your coupons in to Lipp. We hope to have a grand turnout for the convention and that all states will be well represented. We will give you a full report on the convention and the business of the meetings, election of officers, etc., in the next issue of the ARMORED CAVALRY JOURNAL for the benefit of those who cannot attend.

The Los Angeles Chapter is having its first meeting at Patriotic Hall, 1816 South Figueroa Street, in L.A. at 8 P.M. on July 24th and notice of this meeting has

been sent to all members in that territory. William Cohen of 1921 Shenandoah Street in L.A. is in charge of the meeting and getting the boys together, and we hope they have a grand meeting. Anyone in the L.A. district who is interested in joining that chapter is asked to get in touch with Cohen. We will have the details of their meeting for you in our next issue.

Philip Mildenberger (Secty of O'Brien's Company in New Jersey) says that he received a number of inquiries from members of the Eleventh regarding their meeting mentioned in the last Newsletter. Their next meeting is scheduled for Sept. 27 at 8 P.M. at the Terrace View Restaurant at Fort Lee, N. J., but there will be representatives from that chapter at the convention in August.

At a meeting of the New York Chapter on June 20th at the Taft Hotel in New York, General Holbrook (the association secretary) was the speaker of the evening and described convention plans in detail, answering many questions that followed a general discussion. Future meetings of the New York Chapter will be held at the Boulevard Tavern, 405 Central Park West at West 100th Street and all members residing in that area are invited to attend. You may either write us for information, or direct to George D. Halprin, 700 Riverside Drive, New York 31, and your name will be put in the file of the New York Chapter.

The Denver Chapter was launched on June 1st, with a meeting at the American Legion Building with nine members attending. James R. Hoffman was voted the temporary chairman with Bob Mentzer temporary secretary, until after the convention in Chicago, when many topics relating to local chapters will be discussed for their mutual benefit. Denver is having a pre-convention meeting the latter part of July at which time the number attending the convention will be decided.

Post card notices for members in the Boston area were sent to Paul Cratty to be mailed out when the date, time and place of their first meeting has been decided and members in that region have undoubtedly heard from him by this time. We will give you a full report on their meeting at a later date.

We have set up the "Twin Cities" chapter (St. Paul and Minneapolis area) and as soon as John W. Healy (who has undertaken the organizing of that chapter) has recovered from this "twofold" good luck—that of a new son weighing almost nine pounds and a promotion in his firm—members in that area will be hearing from him. We have about 80 members on file in that area and any of you interested who do not receive a notice, contact John W. Healy at 1223 Watson Avenue in St. Paul for further information.

We have a letter from George B. Cordoba (21 AIB) of Oakland, Calif. with regard to forming a local chapter for San Francisco and Oakland and we hope to get this started before the convention, so that chapter will be represented as well as the others. Cordoba sent us quite a nice history of his career as a guitarist with the Eleventh, telling of the joy he brought to many of his buddies in training camp, overseas and in hospitals from coast to coast. We regret that the article is too lengthy to print in whole, but we know those who heard him will remember him for his exceptional musical ability and we wish him a most successful career, now that he can again devote his full time and efforts to his music.

The Washington Chapter held a meeting at the residence of Gen. Holbrook on June 19th with about 16 members present. In the election of officers, Gen. Holbrook was made a lifetime Honorary President—Irving M. Binder (133 AOM), president, Hayden Estey (492 AFA), vice-president, and Morris Stolar, secretary-treasurer of the Washington chapter. Wilmer Sparrow, who just recently returned from the meeting of the Foreign Ministers in Moscow, gave an account of some interesting highlights of Russia and elsewhere in Europe. During the serving of refreshments, the convention was discussed with much enthusiasm and it was decided to have their pre-convention meeting the latter part of July and we hope they will have more members at their next meeting.

We haven't any news of the Cleveland Chapter for you, but we know that Ernest Perlmuter won't let us down and that he will do his best to stimulate interest in both the local chapter idea and the convention.

We want to add a note about the History, which will be priced at $5.00 per copy. Due to unforeseen delays in getting the material from the west coast to the editorial offices in Washington, the history will undoubtedly not be available until the first part of 1948. All members will be notified by post card a month or so ahead of time so they may order as many copies as they wish. It is not necessary to send in payment for it, until you receive this post card notice—however, you may do so, if you wish. Your payment will be acknowledged and credited to you. We have also received a number of inquiries from families of men killed in action—asking if they may purchase a copy of the book and we hasten to say—they most certainly may do so. We have a number of names already on file, to be notified and we ask you readers to pass the word along to these families, if any of them inquire, regarding this matter.

For the benefit of any of you who were not able to determine until the last minute, or those of you who may possibly have had a change in plans with regard to attending the convention at the Congress Hotel in Chicago, August 14, 15 and 16—IT IS STILL NOT TOO LATE TO SEND IN YOUR $10.00 REGISTRATION FEE AND THE TYPE HOTEL ACCOMMODATIONS YOU WISH—TO—BILL LIPP, 3017 East 78th Street, CHICAGO, ILL.—BUT DON'T DELAY ANY LONGER. Lipp tells us that they will be able to take care of some you "last minute" fellows, but we ask that you write him as soon as possible, if

you haven't already done so.

COME ON, YOU "THUNDERBOLTS"—AND LET'S ALL GET ROLLING TO THE CONVENTION IN CHICAGO—LET'S MAKE THE "ELEVENTH" THE BIGGEST AND BEST ASSOCIATION OF ALL TIME. . . . See you in the Windy City.

* * *

**1st Cavalry Division**

Major General Verne D. Mudge, 3036 Elliott Street, San Diego 6, Calif., and Colonel Edmund P. Stone, P.O. Box 201, Pomona, Calif., have been announced as chairman of an executive committee, and treasurer, respectively, of the 1st Cavalry Division Association.

Announcement of the association's postwar leadership was made by Major General William C. Chase, present commanding general of the 1st Cavalry Division. General Mudge commanded the division, until he was wounded at Antipolo, Philippines.

Thousands of veterans who served in the 1st Cavalry Division throughout the hardships and perils of the Pacific campaign, and many soldiers of the division who were demobilized and have since returned, are on the rolls of the 1st Cavalry Division Association.

General Chase also announced the members of the executive committee of the Association. They are as follows:

Major General Innis P. Swift, 347 Garrity Road, San Antonio, Texas, past president and member. General Swift at one time commanded the Division.

Lieutentant Colonel Charles G. Young, JAGD, Hq., 6th Army, Presidio of San Francisco.

Colonel Alfred G. Tuckerman, 125 East 74th Street, New York, N. Y.

Colonel John H. Stadler, Jr., Hq. Army Ground Forces, Officers Assignment Group, The Pentagon, Washington 25, D. C.

Declaring that he was transferring the affairs of the Association to General Mudge and to Colonel Stone, General Chase issued a financial report to the organization, and recommended that the membership take action for use of the Association's fund for the benefit of the members.

General Chase said there were thousands of paid-up members. He said there is $43,275 in War Bonds in the El Paso National Bank and $10,347.24 in a treasury check.

"No money has been spent," General Chase reported, "but I believe it is about time something was done by the Association, inasmuch as for all practical purposes, the war is over."

In announcing that General Mudge and Colonel Stone had agreed to act for the Association, General Chase pointed out the two former officers of the division would not receive any remuneration.

General Chase disclosed that a reunion for members of the Association had been proposed by General Swift, to be held somewhere in the United States this year. General Chase said that letters had been written to all members of the Association to determine their views regarding the proposed reunion, where such a reunion might be held, and how the Association's $50,000 fund will be expended.

General Chase urged all Association members to make sure that Colonel Stone has the correct address of each.

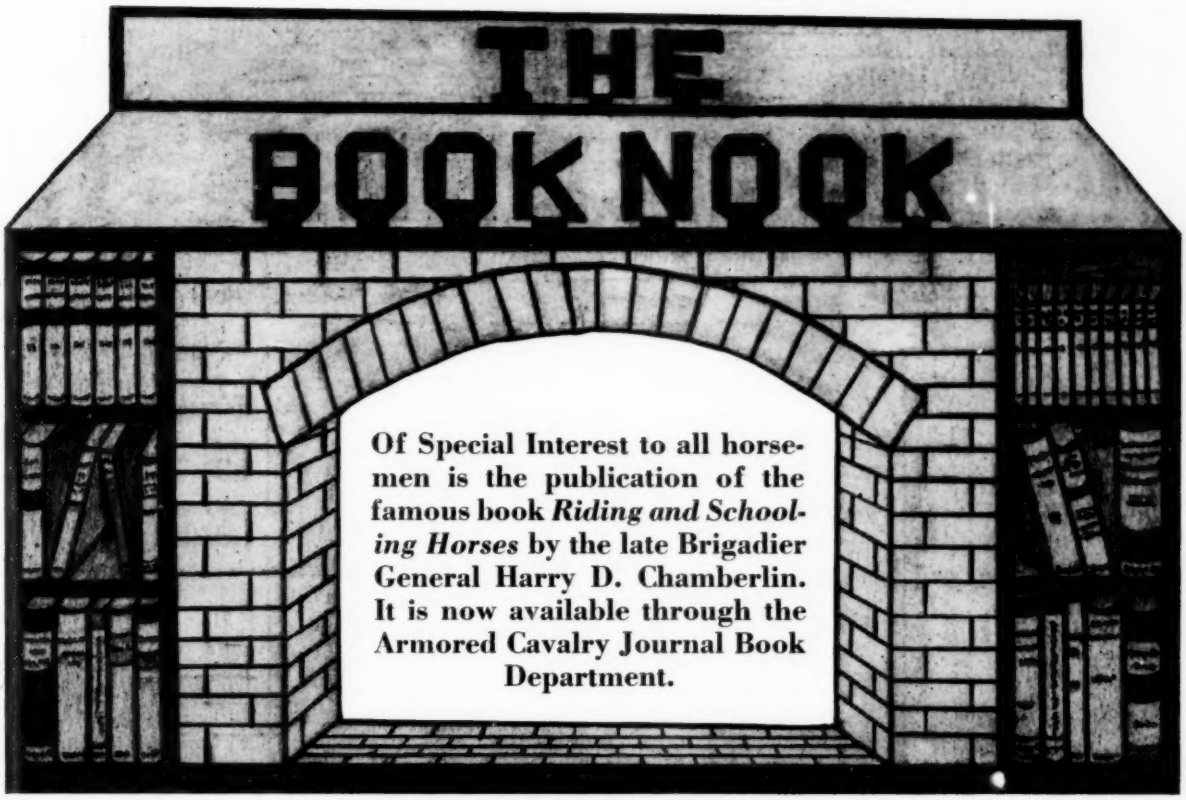
The 1st Cavalry commander announced also that the history of the 1st Cavalry Division is nearing completion, and that plans are being made for distribution of the volume to Association members.

"The famous 1st Cavalry Division is still on duty in the Tokyo-Yokohama area and now has 15,000 fine, alert, young men on its rolls, who are proud and happy to be in this division, and who are very proud of what you fighting men did on the long road from Australia to Tokyo," General Chase concluded.


# RIDING AND SCHOOLING HORSES

## *By The Late Brigadier General Harry D. Chamberlin*

**The Principles of Equitation are laid down in this book in language understandable by everyone. It is a book written to help the reader become a better horseman. There are chapters on Seat, Hands, Application of the Aids, Saddlery, Schooling, and Jumping. This famous book, which has been out of print for sometime, is being republished by the Armored Cavalry Journal. The price of the book is $4.00 a copy. Place your order now.**


THE
BOOK NOOK
Of Special Interest to all horsemen is the publication of the famous book *Riding and Schooling Horses* by the late Brigadier General Harry D. Chamberlin. It is now available through the Armored Cavalry Journal Book Department.

THE ARMED FORCES AS A CAREER. By North Callahan. McGraw-Hill Book Company, Inc. $3.00.

The author, a former Army lieutenant colonel, discusses the opportunities of officers and enlisted men in the Army, Navy, Marine Corps, and Coast Guard. The book traces the history of each service, cites the type of training offered by each, the specialists' schools, the opportunities for enlisted men to become noncommissioned or commissioned officers, and includes complete up-to-date pay tables with monthly rates of pay, retirement provisions, and other benefits.

* * *

WAR YEARS WITH JEB STUART. By Lieutenant Colonel W. W. Blackford, C.S.A. Foreword by Doctor Douglas S. Freeman. Charles Scribner's Sons. $3.00.

These lively reminiscences of the War Between the States were set down by the author in the Nineties and are now published for the first time.

Colonel Blackford, who died in 1905, was 30 when the war broke out. He was married, had four children, and was opposed to secession, but nevertheless, in 1861, shortly after Virginia seceded, he enlisted in the First Regiment of Virginia Cavalry under the command of Lieutenant Colonel J. E. B. Stuart. He took part in almost all the great battles of the Army of Northern Virginia.

He was appointed adjutant of the First Regiment of Virginia Cavalry by Stuart on the battlefield of First Manassas on July 21, 1861, and a few months later was made Captain. Later on he held the same rank in the Engineer Corps on Stuart's staff, became a Major of the First Regiment, Engineer Troops, in 1863, and a Lieutenant Colonel of the same regiment three months later.

While the events of 1861 to 1865 were fresh in his mind, Colonel Blackford, urged by his mother, wrote down his wartime experiences. The manuscript, since the author's death, has been in the possession of his descendants, who have now made it available for publication.

* * *

ONE LAST LOOK AROUND. By Clark Lee. Duell, Sloan & Pearce. $3.75.

This famous war correspondent, who has contributed to the ARMORED CAVALRY JOURNAL several times in past years, has wound up his news writing career with this book. In it he expresses his opinions on the Japanese occupation, conditions in the various Asiatic countries, and wartime censorship of news copy.

One full chapter is devoted to Colonel Le Grande A. Diller, a former brigadier general and General MacArthur's wartime public relations officer. This chapter is all but complimentary to Colonel Diller, who is now stationed at Fort Benning, Georgia, with the 25th Infantry Combat Team.

Mr. Lee condemns many generals and admirals in his book, but he has nothing but admiration for General Douglas MacArthur. Lee was with General MacArthur, with the exception of about 18 months in Europe, from the time the Japs attacked the Philippines in late 1941 until American troops marched into Tokyo.

It was Clark Lee that located Tojo before the American Counter-intelligence agents. He was also responsible for finding several other badly wanted war criminals.

No man is better qualified to write a book on the Far East than Mr. Lee.

Many readers will disagree with things said in this book, however, it is well worth reading.

***How are Things in Hiroshima? Japan? Siam? Java? . . . . What's fun about atom bombs? Who caught Meisinger? —Tokyo Rose? . . .***

# One Last Look Around

**by**
**Clark Lee**

**Clark Lee, former INS Pacific correspondent, draws aside the curtain of censorship from the wartime Pacific—and Europe. Here's the inside story of dramatic, often unreported, events.**

**Captain P. J. Searles (U.S.N. retired) says in the *New York Herald Tribune:* "*Mr. Lee pulls no punches.*" $3.50**

***Send your order NOW to:***
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**1719 K Street, N. W.**
**WASHINGTON 6, D. C.**

THE JAPANESE AT LEYTE GULF. By James A. Field, Jr. Princeton University Press. $2.50.

Here is the greatest sea battle of all time as recorded by an American officer who was able to interrogate the surviving Japanese officers and examine all pertinent Japanese documents.

GENTLEMEN'S AGREEMENT. By Laura Z. Hobson. Simon and Schuster. $2.75.

The story of a newspaperman who pretends to be Jewish in order to do an "inside" story on social anti-Semitism in America—thereby gambling the love of the only girl he cared about.

AMERICAN AGENT. By Mark Gayn and John Caldwell. Henry Holt & Company. $3.00.

Fantastic adventures of a secret service man in China.

STAR-SPANGLED MIKADO. By Frank Kelley and Cornelius Ryan. Robert M. McBride & Company. $3.50.

Two veteran newspapermen have written their observations on the first results of the American attempt to democratize Japan.

THE A B C OF HORSE RACING. By Dan Parker. Random House. $2.50.

How to read the cryptograms that are the racing charts, explanation of the pari-mutuel betting machines, several systems on how to beat the races, and everything else you want to know about horse racing are covered in this book.

BLUE WATER NAVIGATION. By Svend T. Simonsen. Cornell Maritime Press. $3.50.

POWER FOR THE SMALL BOAT. By W. Melvin Cook. Dodd, Mead & Company. $3.00.

HOW TO DESIGN SMALL SAILBOATS. By E. C. Seibert. Dodd, Mead & Company. $3.00.

HANDBOOK OF SAILING. By Charles D. White. Thomas Y. Crowell Company. $3.00.

For the sailing man or woman here are four books of value.

THE SIXTH INFANTRY DIVISION IN WORLD WAR II 1939-1945. By the Division Public Relations Section. The Infantry Journal Press. $5.00.

Here is another history of text and photograph that covers the activities of an Infantry Division through the entire World War II period. A veteran of three major Pacific campaigns the Division fought all the way from New Guinea to Luzon in the Philippines. At the end of the war it was assigned occupation duty in Korea.

AMERICAN MILITARY GOVERNMENT IN GERMANY. By Harold Zink. MacMillan Company. $4.00.

As American editor of the Handbook for Military Government in Germany and later consultant on the reorganization of the German government, Mr. Zink is well qualified to write this book. The book tells the whole story of our military government in Germany: the training of men for the work; the part played by the general officers and GIs; the early temporary measures; the long-range planning in denazification and reeducation; and the harassing obstacles encountered. All the facts are in this book.

RELATIVITY: THE SPECIAL AND GENERAL THEORY. By Albert Einstein. Hartsdale House, Inc. $2.50.

This is a reprint of Einstein's famous book on relativity written so that anyone with the equivalent of a high school education can understand it.

PARIS. Sixty Photographs by Ertiz Henle with Text by Elliot Paul. Ziff-Davis Publishing Company. $5.00.

Here is the photographic presentation of Paris with a 10,000 word text.

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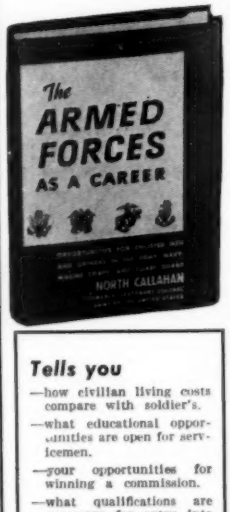


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